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Architecture in the Reign of Queen Victoria.

THE reign, the fiftieth anniversary of which the whole country has this week been celebrating with so much unaffected and loyal good-will and enthusiasm, includes what has been in many respects a most eventful period; more eventful, perhaps, than many of those who have lived through the greater part of it altogether realise. It has been a time marked by immense changes, especially in political and in scientific thought. Whether the first-named class of changes have all been in the direction of progress is a matter on which there will be various opinions and on which we, on principle, abstain from expressing any opinion in these columns, the business of which is not with politics. But as to scientific progress, there can be no question at all. The last half-century has been one of the most remarkable epochs in modern history, perhaps in history of any date, in regard to the strides taken by science and the increased predominance of the scientific spirit. In mechanical science the development of steam locomotion by land and sea, and especially the development of the railway system, is a physical fact the results of which are before every eye, and which is, therefore, the most popularly appreciated. The invention and development of the electric telegraph comes only second to this in popular appreciation; and in comparison with this the science and art of electric lighting and electric motors, destined probably to play as important a part, are really only just at their commencement. But history will place even these achievements, which concern only our material convenience, as far inferior in importance to the great changes which have taken place in what may be called the higher strata of scientific thought. The great generalisation of Darwin, one of the greatest generalisations ever made by one mind, has permeated all contemporary thought, and altered the whole course of ideas in regard to the philosophy of life. The development of the spectrum analysis has placed us in chemical relations with other worlds situated at almost inconceivable distances from the earth, so that we can investigate the chemical constituents of a body whose very disc we cannot optically define with any telescope yet made; and the spectroscope is still, probably, in the infancy of its achievements. These two facts alone,—the promulgation of the Darwinian idea, and the discovery of the power of the spectroscope,—would suffice to stamp this last fifty years as what it essentially is,—a great scientific epoch.

It is not without a direct reference to the subject indicated at the head of this article that we commence by a reference to the scientific achievements of the present reign. It must be admitted that this has not been a great artistic epoch,—not in the same sense and with the same extent of meaning in which we call it a great scientific epoch. And it is well to remember that this admission involves no depreciation of the standard of intellect of the present day. It is only that the most eager and gifted portion of the intellect of the time has been turned in the direction of science, not in that of art.

We cannot, therefore, expect to find the same definite progress, the same well-defined aims, in looking at the art and architecture of Queen Victoria's reign, which we find marking the scientific achievements of the same epoch. Science during this period has known what she wanted; Art has not. Art has been trying one experiment after another, satisfied with each for a time; satisfied permanently with none. But the spectacle is not without its interest, nor have we been without definite progress and improvement in certain respects.

The reign has, at all events, produced one great building; and that is something to say for the architecture even of a long reign, seeing how few and far between such achievements are. But we think the Westminster Palace does merit the title of a great building, and it is interesting to note that its commencement was very nearly coincident with the commencement of the present fifty years we have been celebrating. It represented a kind of forcing forward, in one particular instance, of the architectural movement which was in progress during the earlier portion of the Victorian era, the Gothic revival. There was not at that period any such general movement in favour of Gothic as would have led naturally to the adoption of the Gothic style for a national building of that importance. Some years after the commencement of the Westminster Palace, we were discussing in the columns of this journal, in 1843, the *pros* and *cons.* of the proposed unsuitable columnar Classic façade to the British Museum; Elmes's design for his great building at Liverpool was beginning to be spoken of as a new piece of Classic architecture, which would probably throw Smirke's proposed achievement at the Museum considerably into the shade; and two years later, one of the erections about which public and professional interest was excited was the big piece of Doric architecture which still forms the entrance *pylon* to Euston Station. The employment of the Gothic style, therefore, for our great legislative building actually forestalled the general adoption of the movement in England,—a very unusual event in architecture. Whether Barry would have produced something finer than the existing building had he been left a free hand, instead of being saddled with a style with which he did not naturally sympathise, we can only conjecture now. It is very possible that he would. But the result, as it is, is not unworthy of the occasion.

The Gothic revival, however, was the most important architectural movement operating during a great portion of the present reign, which architecturally might, perhaps, be best remembered as the epoch of the restoring of the cathedrals. It is curious, and perhaps, in a sense, rather pathetic, to look back now to the days when Gothic architecture was the obvious faith and duty of every man, or almost every man, calling himself an architect; when mouldings and capitals were sketched and measured and drawn out as if architectural salvation depended on the work, as, indeed, in the eyes of many, both architects and clients, it actually did. We now regard the matter from a very different point of view. The crisis of Gothicising energy has passed away, and the reaction has some time since set in. There was a great deal of unreason in the blind belief in the efficacy of Gothic reproducing and Gothic restoration, as we have said upon occasion during the time when the movement was still the popular one. But there is no doubt that of late years the tables have been turned too violently. The erection of Gothic churches was really, in a sense, the architectural expression of the spirit of the day. There was a spiritual church revival, and it found its outward expression in part in a material church revival. It led to the erection of a good many mere copies of Mediæval churches, which have lost most of their interest now, but it, at all events, substituted something better and more appropriate and more artistic in church architecture than what had immediately preceded it. The restoration of the cathedrals also has been most unfairly judged by the more recent school of architectural and popular critics. To some extent, restoration,—even as carried out by its most accomplished experts,—no doubt meant the destruction or impairing of the historical and often, to some extent, of the artistic value of a building. But it also meant, in many cases, the raising up of the structure from a state of decay and neglect into one of far greater fitness and serviceableness for the purposes for which it was to be used; and in some cases restoration included an investigation and development of the history of the structure such as reflected the

highest credit on the knowledge and perception of the restoring architect, and brought out facts in connexion with the history of the building dealt with, and that of others of the same type and date, such as constituted a real addition to our critical knowledge of this type of architecture. In looking on the restoring epoch, therefore, while recognising the mistakes that were made, and the over-importance, and even finality, which was then attached to Gothic architecture, let us bear in mind also the real architectural knowledge and study which directed it, and the architectural energy which carried out such an amount of work in church building and church restoring as was done during the earlier part of the present reign, and which at least substituted order and decency and architectural fitness for a state of neglect and decay.

We are now in a second stage of the architectural development of the reign, which began absurdly enough in the mere fashion of taking up a certain later phase of English architecture, which in its original eighteenth-century form pretty nearly represented the negation of all real architecture, except one important quality in architecture, sound and solid construction. But the movement is passing out of that mere fashion phase now, and is developing in a manner which seems to indicate that the later Victorian architecture, however oddly we have come by it in the first instance, seems, as far as one can judge, to have a vitality and a promise of development such as the Gothic revival did not evince. We have, at all events, got beyond the blind faith in copying ancient architecture as the one means of architectural salvation. Most, or at any rate many, of those who copy now *know* that they are only copying, which the Gothic revivalists really, in a sense, did not know; that is, they thought doing it over again was of just the same value to the world as originating it, provided it were correctly and learnedly done. We are not without frequent evidences at present of something like architectural originality, to an extent to which it never was aimed at or thought of in the earlier part of the present reign; there is an intimation of possible further life and growth for it in a new direction, and that is a great gain to be able to register; and it must be recognised, also, that there is at the present moment a greater general interest in architecture, and a greater desire to have something like architectural beauty in our mansions and street buildings, than there has been in any earlier portion of the present reign. Even the speculating builder has caught the noble infection, and makes clumsy efforts to produce picturesque brick houses; and when we remember the general nature and beauties of the new terrace and street architecture which used to be evolved in the London suburban districts thirty years ago, to the happiness and content of all concerned, we must admit that it is a promising sign if even the desire for architectural beauty and expressiveness, the perception that it is something worth taking trouble for, has come to be more generally diffused and tacitly accepted as reasonable.

Four important competitions for great Government buildings have formed architectural events of some interest during the present reign. The first was that for the Foreign Office, the result of which presented, oddly enough, a kind of reversal of the case of the Houses of Parliament, as concerns Gothic architecture. As we have observed, the employment of the Gothic style was enforced by official authority in the case of the Houses of Parliament, before the general taste of the country or of architects would have demanded the employment of the style. In the Foreign Offices, when the Gothic revival was almost at its zenith, and when the most successful Gothic architect of the day had been commissioned to undertake the building, the then favourite style was forcibly dismissed by official authority. Both the incidents are worth noting as curious exceptions to the usual course of architectural design, which has been generally, both before and since the Renaissance, carried out in unison with the general taste of the day, and not in opposition to it. The result of this competition is not regarded by any one, probably, as a fortunate one. The next great competition and the largest and most important in this reign, was that for the Law Courts; and here the magnitude and importance of the work, the scale of the drawings, and the genius displayed in some of them, attracted a great deal of public attention. Here the successful architect was allowed, in the earlier stages at least, rather too much of his own way, even to the extent of pushing aside the colleague who ought, according to the official decision, to have shared the responsibility and honour with him, and whose co-operation would probably have ensured a more satisfactory practical result than we can be said to have obtained. The Law Courts is not a great success; though we think its practical defects have been somewhat unduly exaggerated by critics who had a constitutional antipathy to art-architects generally, or to Mr. Street in particular. It is a building of very marked character, and character of a powerful type, but as a whole we fear it must be taken as a practical expression of the fact that revived Mediæval architecture, however genuine and admirable, was the enthusiasm which the movement evoked in the country, has not been a success as a modern style. The Houses of Parliament is a success, independently of its Mediæval detail, but then in its main plan and architectural grouping it is really not Mediæval; as Pugin said, it is "Tudor details on a Classic body." The Law Courts reflects the true Mediæval spirit more faithfully and forcibly than any other large building of its epoch, a statement which its architect would have regarded as the best compliment that could have been paid him, as indicating that he had achieved the result he aimed at; but the opinion which we expressed from the first, that the building is an illustration of the mistake of attempting to revivify Mediævalism in modern architecture, is now a pretty generally accepted conclusion.

The next important competition was the recent one for the War Office, which, owing to the way in which it was managed, or mismanaged, has had results certainly of less architectural interest than its predecessors, and the result seems likely to be, architecturally, much the same as that of the Foreign Office,—the erection of a common-place building, which no one cares about; though there is no reasonable doubt that the practical and sanitary arrangements of the structure will be much in advance of its predecessors, But the history of the recent War Offices competition also seems to furnish evidence of the growth of the influence of official dilettantism in such matters,—an influence at variance with the production of anything great in architecture; and if we are to credit what is said in the way of rumour and *on dit*, there is a disposition on the part of the Committee concerned with this important building to cut it down to a merely utilitarian structure. It is to be hoped that public opinion will be against such a view of the matter. It is a rather melancholy reflection that at the commencement of the present reign there was both public and official interest felt in the project of receiving something great and striking in architecture for the home of the Legislature, and that after fifty years the architectural result of a great public building seems to be a point about which both politicians and public are indifferent: for this means retrogression in more senses than one. It is to be hoped that the new Imperial Institute, the competition for which has resulted in the appointment of an architect who, though he has not done any great works hitherto, has always shown a distinct artistic power in his buildings, may result in something which will be an architectural gain to the country, and perhaps do something to stimulate again the idea that it is worth while for a Government to spend money in promoting architectural beauty, as well as in merely providing shelter from the weather for its officials.

One of the architectural characteristics of the reign has been the great activity, especially during the last five-and-twenty years, in what may be termed municipal architecture in our large towns, and the number of town-halls, municipal buildings, assize courts, and other such structures, which have been raised here, there, and everywhere. Some of the largest of these have not been great architectural successes; but a good many, both small and large ones, have been very successful and interesting additions to modern English architecture. The great activity in this class of architecture almost dates, we should be disposed to say, from the Manchester Assize Courts, designed by Mr. Waterhouse in 1862, and finished three or four years later. This was the first important building of the kind, or the first which attracted much attention, during the full tide of the Gothic revival, and it had a great deal of influence in stimulating new efforts on municipal architecture. Very recently her Majesty laid the foundation-stone of an admirable building of a similar class at Birmingham, and the comparison of the designs of the two is a good illustration of the course which architecture has been taking in the meantime. Mr. Waterhouse's building was pure Gothic. Messrs. Webb & Bell's design (which, by the way, was selected by Mr. Waterhouse) is Gothic in feeling, but distinctly avoids the reproduction of pure Gothic, and aims at originality and at new departures in detail. So far has this tendency been carried, to modify the models we follow even while using them more or less as models, that Gothic and Classic elements now frequently seem to run into each other in recent designs, and the line of demarcation between the two opposed styles, as they were once regarded, is almost lost.

In two subjects not precisely architectural, in the common meaning of the word, but of the highest practical importance, there has been an extraordinary progress during the last fifty years. One of these is the science of sanitation, which may be said to belong to this reign. Fifty years ago the current ideas upon the subject of drainage and ventilation were comparatively of the crudest kind, and it was hardly recognised that the subject was one specially demanding an architect's attention, except so far as some general perfunctory attention to fall and brick traps was concerned. A good many of the artistic architects are much in default in this respect now, but the knowledge that they are so, and that sanitation is a subject which some one, at all events, must attend to, is forced upon them; and in general there is now a degree of study given to the sanitary requirements of buildings which was not dreamed of fifty years ago; a study which, it may be added, has resulted in the condemnation or absolute reversal of some of the sanitary beliefs and expedients of that period. The other subject we refer to is the progress in regard to the improvement in the habitations of the poorer classes, and the recognition, to some extent at least, of the responsibility resting with landlords and with the Government in regard to this subject. The part taken many years ago by this journal in urging attention to this subject is known to all who are acquainted with the history of the amelioration of artizans' dwellings; and though much remains to be done in this respect, what has been already accomplished may count among the architectural achievements of the present reign; and while we have witnessed the foundation of a new cathedral (unfortunately only a good mediæval copy and with no Victorian *cachet* about it), we may perhaps be justified in thinking that the many blocks of healthy dwellings which have been built during late years, not indeed beautiful architecturally, but representing the possibility of decent, comfortable, and healthy housing for the poor, are as important architectural works in their way as cathedrals and churches. In regard to sanitary progress, by the way, it is worth remarking that one of the most recent pieces of work for which public money was voted was the rectification and putting on a proper and efficient footing the drainage of that same great House of Legisla-

tion, the commencement of which was nearly coincident with the commencement of the present reign; the architecture was done fifty years ago, and adequate drainage supplied now; a significant indication of the progress in practical matters which has been made during the period we are considering.

One of the great works of the present reign has certainly been the embankment of the Thames, which has almost remade that portion of London which borders upon its time-honoured river. Architecturally speaking, perhaps the most has not been made of the opportunity; but still it is a great public improvement, to be numbered among important achievements of the period. The present reign has also witnessed the construction of three important new bridges over the Thames, of which that at Putney, comparatively small in scale, reproduces, however, the essential qualities which went to make London Bridge not only a great engineering, but, in its way, a great architectural work. On the larger bridges lower down the river, Westminster and Blackfriars, one looks with rather a sigh, and on looking to London and Waterloo Bridges, we are disposed to say "the old is better." Though there has been a good deal said of late as to the desirability of drawing architecture and engineering closer together, as a matter of fact the two professions are farther dissociated in the manner and aspect of their works than ever; and the greatest piece of constructional work at present going on, the greatest in some ways that has ever been attempted, is the gigantic structure at the Firth of Forth, from which everything that we generally call architectural design has been entirely eliminated, nothing being left, so to speak, but the bare poles of construction. Such a work as this is an appropriate culmination to a half-century in which the most numerous and remarkable constructional works have certainly been those of the engineers. Engineering has known what it wanted, and the public have known what they wanted from it; that is the secret. In architecture there has been doubt and experimenting on one side, and a good deal of public indifference on the other side. As to the latter drawback, we see little immediate prospect of improvement; architecture is still a kind of sealed book, and a subject of indifference to the public. But the art itself appears to be in a healthier and more promising condition than it was at the beginning of the present reign; it has more of life and originality, is less fettered by precedent, and has a sounder basis of sanitary and constructional knowledge; and these are conditions which may make us hopeful for the future achievements of English architecture during the remainder of a reign which we all trust may still be prolonged for many years.

THE TREATMENT AND UTILISATION OF SEWAGE.*

THIS work was originally published in 1869, after the author had taken an active part in a committee appointed on this subject by the British Association. A second edition was soon called for, and now a third edition is given to the world, with revisions and additions. The general value of the work has, therefore, been sufficiently acknowledged. It consists mainly of extracts and compilations from authoritative reports and other published statements of facts and opinions on the various topics which enter into the subject, and although this deprives the book of much claim to originality, yet it must be remembered that the selection of the matter from such an enormous mass of material involves judgment and knowledge, for which the authors are entitled to credit. The book gives, on the whole, a fair general idea of the question, pointing out its importance, the difficulties attending its solution, and the present state of knowledge and practice in regard to the measures applied, and, so far as opinions are expressed by the authors, they seem fair and reasonable.

There are only a few points we may remark on. In the first place, it is unfortunate that the authors have not been able to make more use of the proceedings and Reports of the Royal Commission on the Metropolitan Sewage Discharge which sat from 1882 to 1884, under the Presidency of Lord Bramwell. The Commissioners, in dealing with this gigantic and most difficult problem, were obliged to extend their investigations over the whole range of subjects connected with sewage treatment and disposal, and it is allowed on all hands that, independently of their judgment and verdict on the special case before them, their published documents contain probably the most valuable and admirably arranged collection of facts and arguments on these matters that has ever appeared. Dr. Corfield's book testifies, in an Appendix, to the value of the Commissioners' Reports, and gives some extracts therefrom, but mentions that they "could not be conveniently included in the body of the work."

Dr. Corfield sets his face against all proposals for the collection of town excreta, asserting that their removal by water carriage is, on sanitary grounds, the only proper system. This is, of course, natural enough. The inhabitants of towns desire to get rid of this disagreeable stuff as quickly as possible, for "out of sight out of mind"; and if when the excreta were turned into the sewers, and carried into the nearest stream, there was an end of them, the opinion would be right enough. But when their further progress, and the mischief they subsequently do, have to be traced, as Lord Bramwell's Commission had to trace them, the case assumes another complexion, which led the Commissioners to say (II. Report, par. 138) that "considering the difficulties that attend the modern drainage system, the question [of town collection] is one that ought always to receive candid attention and fair discussion." They evidently did not think it beyond the power of engineering and chemical skill to devise, some day, a method of removal of such refuse which, while it would be unobjectionable on sanitary grounds, might prevent the destruction of our rivers and streams, and might do what water carriage probably can never do, namely, preserve to the refuse its high manurial value.

There are two systems in vogue for treating sewage,—application to land, and chemical precipitation; and unfortunately most people who have to do with the subject are strong advocates of one and strong opponents of the other. Dr. Corfield is no exception, he advocates irrigation, in which he is right; but he despises precipitation, in which he is wrong. It is true, as he says, that precipitation has not yet succeeded in drawing from the sewage any valuable product, and also that it will not effect thorough purification. But precipitation will do very great good by extracting the most offensive matters, and it will give greatly increased facility for rendering the whole innoxious and inoffensive.

Dr. Corfield is also, we think, somewhat inclined to undervalue the spontaneous natural purification which takes place by oxidation and other influences in running streams. This is a most important element in sewage considerations, and he may learn much about it from the Sewage Discharge Commission.

The book, in treating of house-drainage, says something about water-supply fittings. The authors have evidently taken their information chiefly from London practice; but they are not aware that London has been about the worst-fitted town in Europe, having been given over largely to the tender mercies of plumbers, patent jobbers, and brassfounders, whose interests are anything but consistent with effectively carrying out a constant water supply. To see how this is done, Dr. Corfield must go to Manchester, or Sheffield, or Norwich, or Nottingham.

We are tempted to say something more on the great London sewage drama, but we had better not give way to the temptation, or we shall not only exceed our space, but lose our temper.

* The Treatment and Utilisation of Sewage. By W. H. Corfield, M.A., M.D., &c. Third edition. Revised and enlarged by the author and Louis C. Parker, M.D. London: Macmillan. 1887.

NOTES.

IT is much to be hoped that the Bankruptcy Offices Sites Bill, now before a Committee of the House of Commons, will not be allowed to pass in the shape in which it has been presented to the House by the Government. If the measure be carried it will inflict an irreparable wrong upon that portion of central London in which it is proposed to erect the new buildings. We have previously referred to the scheme, but may here say that the Bill proposes to empower the Government to perpetuate, in a scarcely modified degree, some of the narrow and tortuous courts which lie between King's College Hospital, Clement's Inn, and Clare Market. We are glad to learn that the Hospital authorities and the Strand District Board of Works are opposing the Bill. The Hospital authorities are chiefly concerned on account of apprehended diminution of access of light and air to their premises, especially to their dissecting-rooms. The Strand District Board of Works oppose the Government scheme on the ground that the erection of the new Bankruptcy Offices on the particular site defined by the Government will effectually preclude the making of a very necessary and long-needed street from the west end of Carey-street to the Strand. That a Government should propose such an ill-conceived measure as this would be incredible did we not know what blunders have been perpetrated in regard to public works and buildings in years gone by. But the metropolis has now a strong phalanx of Members, and it behoves those gentlemen to see to it that the Bill does not pass in such a form as to stand in the way of a very necessary street improvement in Central London.

ALTHOUGH the Jubilee decorations and illuminations have been very general in London, there were few that were very notable. The streets which were traversed by the Royal processions naturally made a very profuse display of flags, red baize, mottoes, and flowers; while foliage, flowers, and tinsel were strung together to form festoons dependent from Venetian masts and from house-to-house across the streets. The effect of all this, as seen, for instance, at Regent-circus and Piccadilly, was very bright, though somewhat "higgledy-piggledy." The nondescript "decorations" suspended over the roadway of Waterloo-place, Regent-street were poor in design and wretched in colour, though they were, no doubt, economical substitutes for triumphal arches. In regard to the illuminations, among the most striking and successful effects were those obtained by the use of small incandescent electric lights arranged in rows along or up the main lines of the buildings. The Grand Hotel at Charing-cross was most successfully illuminated in this manner. Messrs. Defries did a great deal of successful work with gas and oil, and a brilliant display was afforded by the illumination of the three principal façades of the Royal Exchange, the Bank of England, and the Mansion House. Another notable display of light in the City was that of the North British and Mercantile Insurance Company, Threadneedle-street. The *Times* office, in Queen Victoria-street, was illuminated by coloured lamps marking the angles of the building, the pediment, and each of the windows, but the colours were not well selected. The *Daily Telegraph* office had a brilliant display of crystal devices, while the *Daily News* advertisement offices were illuminated by electric arc lights embowered in shrubs. The naked perforated iron gas-pipe devices (such as stars, crowns, initials, mottoes, &c.), capable of very good effects when there is no wind, did not show to advantage in the breeze which prevailed on Tuesday and Wednesday evenings. Some of these devices of fire were at times nearly completely blown out, and were a long time in regaining their proper forms, only to lose them again very speedily. One of the most successful effects, seen far and wide along the river banks and from the northern and southern suburban heights, was

the illumination of the tower of the new National Liberal Club on the Victoria Embankment. Just below the base of the conical roof were suspended ten or twelve powerful arc lights. As seen from the immediate vicinity they looked like a circlet of gigantic pearls; from Blackfriars Bridge they looked like a cluster of diamonds. The Junior Carlton Club, in Pall-mall and St. James's-square, had also a very brilliant effect, given by a large number of arc lights.

WE cannot altogether congratulate the country on artistic advance in its new coinage. The head of Her Majesty is a well-executed piece of work, but the additional height given to the effigy by the crown and by the addition of a portion of the bust renders the whole much less adapted to fill the circular area of the coins, the obverse of which has a very awkward appearance, the effigy cutting vertically across it and leaving a large blank space on each side; on the old coins the larger head fills up the space much better, and produces a more correctly decorative effect. The reverse of the half-crown, with its symmetrical circle of delicate alternating devices, is pretty, and shows better decorative treatment than the old one. The new florin, on the contrary, is distinctly inferior to the old one in design: the four radiating sceptres between the shields have a symbolical meaning, no doubt, but they are awkwardly fitted into the design, leaving disagreeable unfilled spaces. The reverse of the old florin is a far better and richer piece of design. The new double florin, or four-shilling piece, is merely an enlarged copy of the new florin.

THE great work on Norman architecture by the late M. Ruprich-Robert is about to be published by MM. Des Fossez & Cie., of Paris (the successors to Morel & Cie.). It will be in quarto form and will contain 100 engravings on steel, eleven in heliotype, four chromolithographs, and a map of ancient Normandy, as well as historical and descriptive text accompanied by more than 200 drawings. From the known ability of its author, the time and care which he devoted to it, and the intrinsic interest of the subject, this ought to prove one of the finest and most valuable architectural publications of modern times. According to the circular sent to us by the publishers the author has preferred, in most cases, to give, not entire buildings in his illustrations, "but portions, separate bays, drawn in plan, section, and elevation, so as to show the system of construction and decoration adopted, rather than more or less picturesque wholes. A common scale has been adopted for certain series of drawings: plans, bays in section and elevation, spires, and other details." Thus it will be gathered that the work is likely to be such as to be specially valuable to architects, and not a mere series of picturesque illustrations.

THE Ἑβδομάς (No. 15) reports the following new discoveries in the Acropolis,—a colossal marble statue which has, unfortunately, lost the head and the greater part of the feet, date not given; a life-sized also headless figure made of polished marble, a small head of very early style, several bases of statues which may possibly be fitted on to figures already found. The next find sounds almost too good to be true,—two bronze statues of Athene are reported, each of about 25 centimètres in height, of very remarkable workmanship. In what way they are remarkable is not told. One of the statues appears to have been discovered between the Erechtheion and the north wall of the Acropolis. It is said to represent Athene in her aspect of Promachos. She wears a long garment and high-crested helmet; her right hand is raised as if she were hurling a spear; her left carries a shield. After discoveries such as these and those which have preceded there will be no excuse if the future historian of Greek art fails to trace the clear sequence of early Attic art. Cannot M. Rhomaïdes give us a second issue of his book the "Museums of Athens," which began with such fair promise a year and a half ago?

THE death of M. Daremberg, joint-editor of the great "Dictionnaire des Antiquités Grecques et Romaines," is deeply to be deplored, not only on personal grounds, but because the issue of this invaluable work has been no doubt delayed by the fact that M. Saglio, the co-editor, has had to work single-handed. We are glad to find he has at length joined forces with a new and most able co-adjutor, M. Edmond Pottier, of the Louvre. The result is the issue of the eleventh part of the work (Cup-Del), and we may now feel assured that the issues will go forward with no unnecessary delay. We sincerely hope ourselves that the next "Encyclopædia" that appears will begin at Z and work back to A. Any one who relies on a lexicon for information on mythology will find himself with a plethora of information as regards Apollo, but he must probably wait some years if he wants to be up to date on Poseidon. Among the most important articles in the new issue are "Currus," by M. Saglio, a really exhaustive treatise on Greek and Latin chariot forms; "Cyathos," by M. Pottier, which will surprise some students of vase shapes; and "Cupidon," by M. Collignon,—this last by no means the best.

SIGNOR GIUSEPPE COLBACCHINI, of Venice, has recently published a brochure of 250 pages entitled "Quattro dipinti di sommi Maestri," giving a description with critical notes of four pictures in his possession attributed to Raffaelle, Titian, Leonardo da Vinci, and Andrea del Sarto respectively. The pictures are an Entombment, by Raffaelle, signed and dated 1508-9; Diana and Endymion, by Titian, said to have been painted about 1528; a Madonna and Child, by Leonardo da Vinci, believed to have been painted about 1490; and the "Disciples at Emmaus," by Andrea del Sarto. The Raffaelle is said to be a hitherto unknown work which is sought to be identified with the picture referred to by the painter in a letter to his uncle Simone di Ciarla dated April 21st, 1508. This picture is signed "R. S." The picture attributed to Titian is said to have been transferred from the Suracco family to the Lombardo family by a deed dated in 1690, and to have remained the property of the Lombardo family from that date until the year 1883, when it came into the possession of the present owner. The book is illustrated by some well-executed photographs of the pictures described.

IN a letter to his friend the editor of the *Berliner Philologische Wochenschrift*, Dr. Milchhöfer reports his discovery of a new dome-shaped grave at Thoricus. He has during his long stay at Athens made a special point of examining, so far as he could, every promising tumulus he came across, but until the present moment with small success. The tumulus in question lies near the high hill Viglaturri, and its circumference at the base is 150 paces. It has been pierced in three places, and it is possible to look down the borings and obtain a tolerably distinct view of the masonry of the interior. The plan of this masonry differs, Dr. Milchhöfer says, from any of the dome-shaped substructures so far known in Greece, but it has a near parallel in the well-known Regulini-Galassi grave. Dr. Milchhöfer is trying to stir up Dr. Schliemann and Dr. Kabbadias (general ephoros of antiquities) to a systematic exploration of the tomb, and unless funds be lacking they are not likely to want much stirring, unless, as is possible, Dr. Schliemann prefers to unearth his own fox.

THE Church of St. Lawrence-on-Sea, near Ramsgate, was extensively restored some years ago; it is now proposed to complete the restoration in commemoration of the Queen's Jubilee. The central tower is late Norman; but the rest of the church is of later date, having been remodelled in the beginning of the fifteenth century, when the aisles and transepts were pulled down, the church lengthened, and aisles added, the central tower was raised 6 ft., and aisles added to the nave, and a porch built on the south side. Mr. J. L. Pearson, R.A., has examined the tower and reports that the piers are substantially upright, the deviation from the perpendicular being in no case more than one inch and in some instances much less. On cutting into the north-west pier the mortar was found to be good and the work substantial. Mr. Pearson proposes, however, to expend 400*l.* upon the tower. It is also proposed to erect an external staircase to the ringing loft at a cost of 140*l.*, and a further sum of 1,370*l.* is proposed to be spent on the repairs to the roof and south porch.

IT is now nearly ten years since we noticed* the proceedings of the Salford Town Council in regard to the "Wilton Hospital Competition," when the designs of Mr. Stephen Salter, of London, were accepted for altering and adding to a row of houses at Cross-lane, Salford, in order to adapt them as a hospital for patients suffering from infectious fevers within the borough. Since that time the hospital has been used for the purpose with, we believe, more or less success, upwards of 4,000 patients having been admitted into its wards up to the end of 1886; but it could never be regarded as a good infectious hospital worthy of so important a borough. It now appears that the London and North-Western Railway Company, requiring to enlarge their premises adjacent to the hospital, have arranged to purchase it from the Corporation, and the latter have accordingly in contemplation the erection of a new hospital elsewhere for their district, and an opportunity is afforded for the erection of a new hospital not only adequate to the wants of the borough, but embodying all the most recent improvements in this important branch of Local Government buildings. The Corporation appear to be fully alive to the opportunity thus afforded them; for, acting under their instructions, Dr. Tatham, the Medical Officer of Health, has prepared a very instructive provisional Report upon the whole subject. Dr. Tatham has taken great pains to obtain the latest information upon infectious hospitals. He acknowledges assistance received from Dr. Thorne Thorne and Mr. Gordon Smith, of the Local Government Board; and likewise from Dr. Collie, of the Eastern Hospitals at Homerton; and likewise Mr. Shirley Murphy, late Medical Officer of Health to St. Pancras, and formerly Resident Medical Officer of the London Fever Hospital. According to this Report, it is recommended that the new hospital should be arranged for 200 patients, though it is considered that, in the first instance, accommodation for only 160 patients may be sufficient; and a site 10 acres in extent is advocated. The amount of space requisite for each patient and the most suitable sub-division of patients, and the arrangement of ward blocks, are next considered; likewise the necessary administrative arrangements and extent of staff that may be requisite for such a hospital. In all these matters the Report is of special interest and value as affording much detailed information respecting the planning and management of hospitals for the treatment of patients suffering from infectious diseases, and, as such, it will be found useful by architects and others engaged upon such works.

IN the course of this season the Healeyside, Northumberland, and the Langton Hall, Yorkshire, estates will be offered for sale. The former is a manorial freehold of some 22,000 acres, locally famed for its picturesque situation in the North Tyne Valley, to whose scenery it largely contributes. Within the confines of this property lie portions of the quaint old town of Bellingham, site of a Roman Station. Here is excellent fishing for salmon in the North Tyne, which forms a wide stretch of water within the park, and for trout in the Irthing. The holdings on the estate comprise several stock-breeding farms, of good repute in the county. Langton Hall, of red brick, in modern Gothic style, is distant five miles from Northallerton. Approached by a stately avenue, it overlooks the Vale of Mowbray, and the Swale, renowned for its grayling. The agricultural portion of the

* See the *Builder*, Nov. 2nd, 1878, vol. xxxvi., page 1159.

estate, which is 1,230 acres in all, yields an annual rental of 1,300*l.*

WE have to mention two more memorials to the late Earl of Shaftesbury. On Friday, June 17th, Louisa, Lady Ashburton, laid the first stone of the Shaftesbury Memorial Mission Hall, in Kerbey-street, East India Dock-road, where the committee's labours will be devoted to gospel services for adults and the young, a Sunday ragged school, winter lectures, and above all, to the providing of meals for destitute children. On the same day the Prince of Wales performed the same function on behalf of the new Home in Shaftesbury-avenue, which has been established by the Society of National Refuges for Homeless and Destitute Children. The Society began their operations in 1843, with a first year's income of 180*l.*, in a cow-shed loft in a now demolished St. Giles's rookery. In 1852 they opened their Ragged-Schools and Home in Broad-street, St. Giles's, and secured a lease of No. 8, Great Queen-street, where 150 boys are housed. In addition to the training-ships, *Chichester* and *Arethusa*, they have opened industrial schools at Fortescue House, Twickenham; Bisley, Surrey; at Sudbury; Ealing; and elsewhere. Thus they have accommodation for 1,000 boys and girls. For twenty years past the Society's income has exceeded 20,000*l.* per annum. This new Home, to be styled "Shaftesbury House," is intended to take the place of a temporary home at 25, Great Queen-street. The architect is Mr. E. P. Loftus Brock, F.S.A.

ON Thursday, June 16th last, the President and Council of the Zoological Society celebrated the Jubilee by a reception of the Fellows and their guests in the Gardens. The Society was founded in 1826 mainly by the exertions of Sir Stamford Raffles, Sir Humphry Davy, and Lord Darnley: the first-named giving to it as a nucleus for the museum his fine collection which was originally stored at No. 33, Bruton-street. Sir Francis Chantrey and Decimus Burton laid out the ground which the Government allotted to the Society; Burton also built the animals' houses and other enclosures; and the Gardens were opened in 1828. King George IV.'s menagerie was removed hither from Sandpit-gate, Windsor, in 1830, and four years later the last of the "lions" from the Tower. The Aquarium, being the first of its kind, was constructed in 1854.

THE Crown Lease of St. John's Lodge, at the northern side of the Inner Circle, Regent's Park, together with its twelve acres of private ground, is about to be sold. This finely situated mansion, designed by Decimus Burton, was long the residence of Sir Isaac Goldsmid, and is now occupied by his widow.

THE Reform Club, which has just celebrated its fiftieth anniversary, was established by the Right Honourable Edward Ellice from out of the old Westminster Reform Club, which existed, rather than flourished, for two years. Brooks's refused to countenance the enterprise, and the members were at first fain to rent some rooms in Carlton House-terrace. Nevertheless, on the Princess Victoria's birthday their numbers had reached to 1,000 subscribers, of whom, it is said, ten are yet living. In June, 1838, certain houses were demolished in Pall-mall,—one of them being Angerstein's, No. 103, and which had held his picture gallery,—for the present building, whereof the elevations were adapted by Barry from the Farnese Palace in Rome. Here the Reform Club was installed on March 1st, 1841, removing from Gwydyr House, Whitehall, since occupied by the Local Government, or old Poor-Law, Board and now by the Charity Commission. At Gwydyr House they gave their historic Coronation feast.

IN virtue of the Medina Subway Act, 1884, a company has been incorporated to construct a subway beneath the mouth of the Medina river, in order to connect the two towns of East and West Cowes, Isle of Wight. The existing ferry is about 140 yards across, its traffic, being carried in boats and a steam chain vessel, is at present leased by the Commissioners of Her Majesty's Woods and Forests. Failing the ferry, a detour has to be made inland, *viâ* Newport, which is distant between four and five miles. The new subway will be about 430 ft. in length (with easy approaches), and high enough for the passage of a four-horse coach. A contract has just been made with Messrs. Green, Parker, & Co., of Cardiff, for the construction of the works within eighteen months, for the sum of 43,000*l.* The company's engineer is Mr. James Abernethy, of 4, Delahay-street, Westminster.

ON Saturday, June 11th, the Baroness Burdett-Coutts laid the foundation-stone of St. Augustine's Church, Archway-road, Highgate. It replaces the little iron church in All Saints' parish, which the congregation have, much to their credit, voluntarily supported for the past twelve years. When completed, the new buildings (Mr. J. D. Sedding, architect), including vestries and classrooms, will cost altogether 7,500*l.* The purchase-money, 500*l.*, of the site was originally met by a grant from the Bishop of London's Fund, and a loan, in 1874. All Saints' parish had then just been taken out of the ecclesiastical district of St. Michael's; and all this part of it, with a now population of 4,000, was green fields.

A FEW days ago the Marylebone Cricket Club commemorated their first centenary by giving a banquet in the Tennis Court at Lord's. The oldest recorded match of the Marylebone Club is one in which the members took part, May 27th, 1788, on the ground that is now covered by Dorset-square. They migrated to Lord's ground in 1814 or 1815. The present cricket-ground, originally about 7½ acres in extent, has been somewhat enlarged of late years along its eastern side by the florist's garden. The rsbuilding of the tavern, the erection of stands and turfed ranges of seats, together with the making of new entrances and carriage drives, have quite changed the pristine aspect of the ground.

AMONGST the pictures of the late Earl of Lonsdale which were sold on Saturday last [June 18th] at Christie, Manson, & Wood's, were two large views, by P. Pannini, of the exterior and the interior of St. Peter's, at Rome, together with his Forum, and composition of Roman ruins. The collection included Hogarth's portraits of Mrs. Garrick, in straw hat and pink and white dress, from the Wadmore collection; and of Peg Woffington, in a blue and white gown, and having a canary bird on her left shoulder; some "beauties" by Lely; Gainsborough's "Horses Drinking at a Spring," formerly in Mr. J. L. Parker's collection; Reynolds's laughing girl, which was exhibited, together with the last-named, at Burlington House in 1867; a Teniers; several Watteaus; Lawrence's portrait of J. Wilson Croker; and so on. Three views of London by S. Scott are worthy of record. The largest, being 36 in. by 54 in., is a perspective of the Tilt-Yard, or, as it is more commonly termed, the Horse-Guards' Parade, St. James's Park, as seen from before the now demolished Gun House. The troops are shown as exercising; in the distance stand the Treasury Chambers and the Prime Minister's Lodgings on the northern side of Downing-street. The other two, 18 in. by 36 in., delineate London and Westminster as seen from the Thames,—that is, from a point about level with the Privy stairs below Labelye's Westminster Bridge (1747); and from what we take to be the earlier Temple Gate, near to Whitefriars. Scott's view of Blackfriars and Bridewell Dock may now be seen in the Guildhall Art Gallery. His Westminster shows Derby House, and the Bear at the bridge foot: this painting was engraved by Canot in 1758. The Lonsdale Canalettos include two paintings of the Rialto and the Grand Canal.

ONE of the best positions for viewing the procession on Jubilee Day was the stand erected by Messrs. John Mowlem & Co. in front of the large block of buildings in course of construction on the south side of Piccadilly, at the corner of Arlington-street, belonging to Lord Walsingham. The stand was gaily decorated, and an excellent band, hidden in the building, played at intervals. Among the company were Lord and Lady Walsingham, Hon. W. Cody (Buffalo Bill, whom Her Majesty recognised as she passed), Mr. Alfred Waterhouse, Col. Haywood, Mr. Thos. Blashill, Mr. T. Cubitt Nicholls, Mr. W. O. Milne, Mr. Geo. Crickmay, and others.

IT appears from a paragraph in last week's *Illustrated London News*, before which, as the Laureate says,—

—— "lie bare
The abyssmal depths of personal(i)ty."

that the will of the late Mr. George Devey, architect, who died on the 4th November last, was proved on the 2nd inst., the value of the personal estate amounting to over 32,000*l.* This is a pretty large sum, as times go, for a man to have accumulated by his own exertions in a profession the emoluments of which are not over-liberal, and proves that if some members of the profession are scarcely remunerated there are others who must be looked upon as fully compensated for their exertions. The three richest men in the profession of late years were Sir Wm. Tite (who, as he was wont to boast, inherited one fortune, made a second himself, and married a third), Mr. J. B. Bunning, and Mr. Lewis Vulliamy. Mr. Devey leaves legacies of 100*l.* each to the Architects' Benevolent Society, the Artists' Benevolent, and other societies. The residue of his property the testator, who was unmarried, bequeaths to his brother and sister, in equal moieties.

A CORRESPONDENT writes:—"In your issue of the 4th inst., 'An Architect' is stated to have said, 'Temple Bar has been sold and will shortly be erected in private grounds,' and in your next issue the *City Press* is stated to have contradicted this. Allow me to state I had a conversation with a contractor just a month since, who stated he actually had the contract to erect this ancient relic in a gentleman's park not fifty miles from the City." Is this the case?

ARCHITECTURE AT THE ROYAL ACADEMY.—IX.

1760, "Church of St. John the Baptist, Brighton: Proposed new Façade and Tower," Mr. Samuel J. Nicholl. A good water-colour drawing (illustrated in the *Builder*, May 21) of a very clever and original design, which has the unusual merit that, while it looks well, it is impossible to pigeon-hole it under any special style. A deeply-recessed round-arched doorway between two solid masses of masonry is richly decorated with ornamental details and figures of cherubim; in the tympanum of the arch, over the square-headed doorway, is a mosaic subject on a dark blue ground. A strong dentil cornice terminates the sides of this portion of the building, and runs round across part of the front, but is interrupted over the doorway to give space for a large circular window, with mullions in the form of a cross, and a boldly-sculptured wreath surrounding the architrave. The whole front is finished with a pediment with a raking cornice. The manner in which the main architrave is broken and lifted up to form a lintel to the two windows on each side of the entrance is an eccentricity which would shock an architectural purist; but it does not look bad. The tower is not quite so effective as the façade, but harmonises with it in general treatment; the detail might be improved here. The building is one of the most distinctly original designs in the room.

1761, "New Church at Stratton, Hampshire," Mr. T. G. Jackson. A small and unpretending country church with a low tower at the north side of the chancel, with a slated or tiled spire; apparently built of flints or small rubble, with ashlar dressings; a chequer work of squares is formed over the east wall above the sill line by the arrangement of the two materials, and an inlaid wall arcading formed below the east window in the same manner; a similar arcading is repeated on the plinth of the tower. The whole is very

"country-church" looking, with a touch of novelty about it, though strictly Gothic in detail. The windows in the upper stage of the tower seem crowded rather too closely up to the eaves.

1762, "Design for Roman Catholic Church, N.B.," Mr. A. J. Gordon. An exterior of a Gothic design shown in a rather mechanical pen drawing; the only notable point about it is the curious treatment of the tower, a large square one with no buttresses, built with a considerable batter, finishing with a heavy corbel table in a castellated style, with a solid stone lantern or short spire above, and heavy angle turrets. This is apparently by way of assimilating a Scotch church to the Scotch castellated style, and the feature is effective in its way, and would have been still more so if the author had kept the stalk of his tower a more unbroken mass instead of cutting it up so much with windows of various shapes and having no particular relation to each other.

1763, Chapel, St. Chad's College, Denstone," Messrs. Carpenter & Inglelow. A simple Early Gothic interior with an open timber roof; hung too high to be well seen.

1766, "A Parsonage," Mr. John Cash. A pretty and artistic sketch in pen-and-ink of a picturesque house, but the author in his anxiety to escape from the hardness of anything like rigid lines has gone to the other extreme and been unnecessarily "shaky" in many places. There is a re-action against rulers at present in architectural drawing,—a re-action long wanted; but it does not follow that one should go to the opposite extreme and draw a building without a straight or even a clean line in it. To draw clean lines without the ruler is the desideratum.

1767, "The Old Gatehouse, Lanhydrock, Cornwall," Mr. J. M. MacLaren. A very harmonious and artistic water-colour drawing of a charming old gate-house, with octagonal turrets flanking a semicircular archway: a curious mixture of very Late Gothic and half Classic details, with a battlemented finish and singular pinnacles with ball terminations, and apparently supported on groups of similar ball objects.

1768, "Entrance Porch, Quarrydene, Westwood, Leeds," Mr. W. H. Thorp. Apparently this is hung under the last-named as a modern comment on it, for here are seen, carefully drawn out, the same ball-supported and ball-terminated finials. The drawing is a clean well-executed pen perspective of a porch dated visibly "1885," but imitating the manner of the English Renaissance.

1769, "Byrkley Lodge, Staffordshire, North-East View," Mr. R. W. Edis. A very good "architectural draughtsman's" water-colour of a large red brick mansion with stone dressings, mullioned windows, angle quoins, and Classic columns to the porch. The tower over the entrance, with octagonal angle turrets, is the only departure from general Elizabethan detail. The general appearance is dignified and has the proper "English gentleman's mansion" appearance, though with nothing special to remark in it. There is no plan.

1770, "Bank of England: New Fleet-street Branch," Mr. A. W. Blomfield. We may refer our readers to the illustration of this, published in the *Builder* for May 21 last. It is a powerful-looking design, with a "bank" appearance given to it by the heavy rustication up to the line of springing of the entrance-door, a less marked rustication being continued up to the first-floor cornice. The symmetrical square pavilions at the four angles increase the look of solidity characteristic of the whole. Classic style, we presume, was an imposed condition, the branch Bank of England buildings having all been erected in a style intended to connect them with the central establishment; indeed, the present design shows considerably more breaking away from Bank of England precedents than we have noticed in any other of these buildings.

1771, "New Chancel and Transepts, Dewsbury Parish Church," Mr. Arthur E. Street. This is a large and rather bare-looking water-colour of an interior with a marble floor of various colours, and piers and arcades white in one portion of the drawing and brown in the other; this seems like an attempt to differentiate to the eye the new and old portions, but if so it is overdone, and the result on the drawing is not happy. The new (?) portions show arcades without any imposts (at least in the chancel) of late Gothic type, carried out with knowledge of the style, but with no feature calling for special comment.

1772, "Killesley Hall, near Scarborough," Messrs. S. E. Smith and J. Tweedale. Two exteriors and an interior of a house apparently very picturesquely treated, and which might have claimed to be hung lower than it is. The effectiveness of the building is derived in great measure from the characteristic grouping of the features; the rows of small windows in one portion, the two large mullioned windows grouped on the other front, the half-timber marking another portion. There is no plan, so we cannot tell how far these variations express the interior.

1773, "House at Bickley," Mr. Ernest Newton. Over-acted simplicity; a house that seems to say, "Observe how humble and unpretending I am." That is a kind of architectural affectation, though by no means so disagreeable as the affectation of the opposite kind.

1774, "Scheme of Decoration for a Drawing-room," Mr. John J. Shaw. This is an effective piece of work, though better suited for a dining-room than a drawing-room. There is a door and dado of dark wood, with carved panels (medallion heads of Homer and Dante in the two principal panels); a frieze over the door of gilded Cupids and seahorses with entablature over; crimson wall panels with a floral diaper; a peacock frieze at the top of the wall in long panels, and interrupted by gilded winged genii between the panels. The general effect is rich, though a little sombre, and the peacock frieze very finely and decoratively treated.

1775, "Lower Ince Church, Wigan," Messrs. Paley & Austin. This is a charming little church exterior with a good deal of character, with its double transepts and picturesque bell-gable with an octagonal spike rising from the middle of it; but why did the authors do injustice to it by so hard and mechanical a drawing? The ruler has had it all its own way here, at any rate.

1777, "New Church at Northington, Hampshire," Mr. T. G. Jackson. A church in Late Gothic style, with four-centred windows, and treated otherwise much in the same manner as No. 1761, already mentioned, with a similar inlaid wall arcade under the windows of the octagonal east end; the church is a rather larger one, and is battlemented throughout, giving a different and less rural expression. The small pinnacles springing from the buttress slopes look very feeble: they may be proper to the *genius loci*, but they have no other recommendation.

1778, "Interior of Notre Dame, Châlons-sur-Marne," Mr. Arnold B. Mitchell. A very well-drawn perspective of this fine Early Gothic interior, executed with the same white spaces and brush-shading as in the author's other drawings exhibited; it has the advantage of getting an effect very quickly, and with little labour on the drawing, and the author knows thoroughly how to use it.

1779, "Entrance Lodge, Walmer, Kent," Mr. James Neale. A study of a large tree trunk, with the lodge behind as a secondary object. The whole makes a pleasant little picture.

1780, "Club-house, Shipston-on-Stour," Mr. E. W. Mountford. A small drawing of a village club-house, looking like what it is intended for.

In concluding these brief notes on the architectural drawings of this year, from which we have omitted only those drawings which seemed to present nothing for remark (which were not many), we may draw attention to what we have more than once adverted to in passing, the too great prominence which seems to be given, in the choice of drawings for hanging and in the placing of them, to mere effectiveness of draughtsmanship. It seems to have now come to this, that if you can get one of two or three favoured draughtsmen to make your drawing, you are pretty sure to get hung, even with an indifferent design. We never remember to have seen before such large groups of drawings with the names of various architects attached to them, but obviously all drawn by the same hand. This is just what ought not to be. It is reducing the architectural room to an exhibition of draughtsmanship. There ought to be special favour shown to those architects who make their own drawings, provided the designs are good, rather than to those who merely exhibit their capacity of appreciating and paying a popular draughtsman.

THE NEWCASTLE EXHIBITION.

WE have not had an opportunity before this of giving any special account of the exhibition at Newcastle, which, though on a much smaller scale, and in other ways less important than the Manchester Exhibition, holds a very good place among general exhibitions of this kind, and has the merit of being well classified and arranged.

The buildings are arranged in a quadrangle extending about 600 ft. from north to south, and 500 ft. from east to west, enclosing a centre court or garden 340 ft. by 270 ft. The North Court, at the east end of which is the main entrance from the north road, is much the largest in area, being about 200 ft. in width; the South Court being only a comparatively narrow one of about 60 ft. width. Outside the North Court, and adjoining its north side, are the exterior gardens, where an artificial lake has been formed, chiefly for the purpose of giving as much of realistic effect as may be to the reproduction of the old Newcastle bridge, which is built in an oblique line stretching over the water. Various pavilions are disposed about this part of the grounds, many of them partaking rather of a "fancy fair" character, including a Paris panorama, a camera obscura building, a châlet of Swiss goods, a toboggan slide, &c., though there are also more practical exhibits to be seen in the grounds.

The North Court contains the exhibits in illustration of the great engineering industries which form the most prominent portion of the exhibition, and some of the most important of which are specially connected with the neighbourhood of the Tyne. Marine architecture, steam engines, heavy forgings, and ironwork generally, are here represented; forming a curious commentary on the history of the neighbourhood which first became notorious, and had a name, by the building of "the new castle on the Tyne," still in such excellent preservation, though now the oldest conspicuous monument in the place to which it still gives the name of "new." The material progress is extraordinary enough, as also the change from the feudal domination of the castle to the development of a great industrial centre; but possibly the moral progress in some ways is not so great, after all. The building of a castle with walls of some dozen feet or so in thickness was one way of overawing your neighbours and imposing your own will upon other people; it seems a clumsy way now, and would, at all events, be inefficient in the present day; but, after all, the scientific manufacture of guns at the Elswick works, which are very largely represented here, is only a highly-elaborated effort in the same direction.

However, the arts of peace occupy, no doubt, the larger portion of the Newcastle Exhibition. The right-hand alley of the North Court, as we enter, is mainly devoted to ship-building exhibits. We may observe that the numbering of the exhibits for cataloguing has been done in a much more systematic manner than is generally the case in such multifarious exhibitions as this; exhibits being ticketed in numerical order down the right-hand side of the first aisle, up the left-hand side, and then down the right-hand side of the next, and so on: a simple matter, it may appear, but one which is seldom properly attended to. The result is that in the Newcastle Exhibition it is in most cases possible to find an exhibit which you wish to see, from its number in the catalogue; and we have been in few such exhibitions where this was the case; certainly it was not so at the large shows held during the last few years at South Kensington, and notably not in the permanent South Kensington Museum itself, where nothing can be found except by chance. Armstrong, Mitchell, & Co. are the great exhibitors in the marine architecture department, their works being represented by a great number of beautifully-executed models, some of them sectional, and representing vessels of almost all classes and for various Governments, but fighting vessels of various types predominating. Among the specialities in the exhibits of this firm are half models of vessels built for service in the Caspian and Black seas for burning petroleum fuel; a half model of the twin screw steamer *Faraday* built in 1874 for cable laying, with bow and stern alike, and a rudder at each end for moving either way with equal facility; and a model of the 100-ton floating crane *Atlas*, built in 1885 for the Mersey Docks and Harbour Board, five knots speed, built to lift 100 tons at a radius of

30 ft., the counterbalancing being regulated by water ballast. The Italian Government, "per H. F. Swan, Esq., Newcastle-on-Tyne," are large exhibitors of marine models, including sectional models of some of the largest of the Italian ironclads. Among their exhibits is also a model of a Venetian galley of the fifteenth century, with three banks of oars on each side; but the accuracy of this reproduction seems doubtful; at least, if it is correct the efficiency of the three tiers of oars must have been more imaginative than practical. Among various exhibits in this gallery we noticed Messrs. Dobson & Co.'s patent steam hopper vessel, as used on the Ouse improvements for the construction of training walls and embankments; a vessel constructed for carrying ballast and stone in hoppers, to be dropped through the bottom for deposit in building up embankments. Messrs. Cail & Davis's exhibit of steel and iron sheets shows the ductility of their mild steel by a sheet bent cold in eight folds lying one upon another,—a pretty good practical test.

The next aisle of the North Court shows some large locomotive engines, among which, exhibited by the North-Eastern Railway Company, is "Locomotion," the No. 1 engine on the Stockton and Darlington Railway, built by G. Stephenson in 1825, with two vertical cylinders rising from the top of the boiler, working with cross-heads and long connecting-rods on the wheel-cranks. A curious spectacle it must have made when in motion. The position of the cylinders seems, at all events, calculated to avoid the difficulty of cooling of the cylinder, and consequent condensation of steam at starting, which in the modern locomotive requires the provision of a special tap for blowing the water from the cylinder. Next to this, in effective contrast, is a new engine of the largest size from the Doncaster workshops of the Great Northern Railway Company. Near this is a locomotive exhibited by the North-Eastern Railway Company, designed by their locomotive superintendent, Mr. J. M. Worsdell, which is of special interest: it is a modification of the principle of Mr. Webb's three-cylinder engine for utilising waste steam at low pressure, in use on the London and North-Western Railway, and to which we have more than once referred. Mr. Worsdell's engine works with only two cylinders, — a small high-pressure (18 in. diameter), and a large low-pressure one (26 in. diameter), side by side; the high-pressure one can be used alone at starting. Whether this simplified arrangement gets rid of any of the difficulties experienced in the three-cylinder engine at starting only practical trial can prove; the engine has been running for three months on the North-Eastern Railway, but what its performances have been we have no direct means of knowing. Near this we observe in the catalogue, but did not notice it at the time, what, if it acts well, ought to be a very useful improvement in tramway cars, by the Ashbury Railway Carriage Company, namely, a reversible tram-car turning round on a bogie frame, so as to avoid the necessity of unyoking the horses and taking them round at the end of every journey. Among the rolling stock exhibits is an engine specially made by Messrs. Hawthorn, Leslie, & Co., of Newcastle-on-Tyne, for a light 3 ft. 6 in. gauge line in Australia; and boiler and furnace arranged for wood-burning. There is also a locomotive by Stephenson & Co., of Newcastle, from the designs of Mr. Adams, of the London and South-Western Railway Company, described as fitted with Adams's patent vortex blast pipe, which has been in use on this railway since 1885, and is stated to have effected a considerable economy in fuel, but the principle of the blast pipe in question is not illustrated. The engine is on the well-known pattern in use on the London and South-Western Railway, with a front bogie carrying four leading wheels, with the wheel base far in advance of the main bulk of the engine. How does this bogie frame, pushed in advance, with the weight of the engine behind it, behave in running fast on a down gradient, is a question we should like to see put. We believe some of the drivers have opinions on the subject.

It is impossible to do more than note a few more of the principal exhibits among the mass of work to be seen in the North Court. As before mentioned, the Elswick gun manufactory is very largely represented, and the description of the work occupies some pages of the catalogue, and constitutes a kind of brief sketch of the recent history of English gunnery. A model (full size) of the 110-ton Elswick gun is exhibited, with a lengthy description; a 30-pounder "rapid-fire gun," field guns, howitzers, and Gatlings; also projectiles, including the shell for the 110-ton gun, weighing 1,800 pounds. A statement of the cost to the country of firing each round of this gun would have been an interesting statistic. From the great guns to the surfaces for resisting them is a natural transition; and Messrs. Brown & Co., of Sheffield, exhibit, among various other specimens of forging, some steel-faced armour plates. The Darlington Forge Co. exhibit some fine work in solid and "built" crankshafts and other heavy forgings; and the Leeds Forge Company show, among other things, a very large frame plate flanged at one heat from a single plate of Leeds steel. Among the specially illustrative exhibits are those of the Darlington Steel and Iron Co., who illustrate the process of rolling railway iron, giving pieces showing the forms taken by the bar after each successive roll, from the square "bloom" to the finished rail; and those of Messrs. Bell Bros., of Middlesbrough, who give a very complete set of specimens showing "what it takes to make one ton of Clarence pig-iron," in the shape of examples of the ironstone, the coal, the quantity of limestone used, and one ton of iron, and the slag resulting from the smelting of the materials. The Kirkstall Forge Company show rolled shafting in steel and iron, which boasts to be of such finish that no turning is required, and the specimens shown are certainly admirable examples of what can now be done in rolling-mills. Messrs. J. & F. Howard, of the Britannia Ironworks, Bedford, exhibit the materials for a patent portable railway, with steel sleepers, the sleeper and "chair" in one piece, and the rail keyed up with a metal safety key. The Wallsend Slipway and Engineering Company send a fine specimen of boiler architecture, built up in Siemens-Martin steel, manufactured by the Steel Company of Scotland. Among the engine exhibits we should not have passed over Messrs. Hawthorn, Leslie, & Co.'s triple expansion engines, with cylinders of 20 in., 27 in., and 42 in. diameter respectively, for developing a large power with a light weight: this type of engine being specially intended for torpedo cruisers. Messrs. Taylor Bros. give a number of samples of iron and steel castings and forgings; and Messrs. Tozer & Son have a good exhibit of steel sleepers, with self-fastening cast-iron chairs, clipped on without the introduction of any bolts or other fastenings. If these are to be relied on, they ought to constitute a considerable economy in platelayers' work on railways.

Messrs. Doulton & Co., it may be mentioned here, have two elaborately decorated interior pavilions erected just within the entrance to the North Court, exhibiting both the artistic and the sanitary work of their firm.

In the East Court, to the left from the main entrance, are grouped a good many exhibits of a class coming more or less under the head of furnishing and decorative work of various types. The first object numbered in the catalogue is a "Jubilee Mining, Engineering, and Science trophy," in silver, of which the less said the better; the main portion of it is a poor model of the famous tower of St. Nicholas Church, one of the well-known architectural attractions of Newcastle. The second number is a much less pretentious item, which, however, deserves praise; an "excelsior" blind-cord and pulley, by Messrs. Hargreaves, of Stockton-on-Tees, in which the blind-cord is kept stretched by a neat looking brass weight attached to the pulley-slide; simple enough, but entirely effectual, and which cannot get out of order until the cord breaks from age. There are a set of decoratively furnished rooms here, a feature one meets with in every exhibition now, whether it be "Healtheries, "Inventories," or whatever else in "ies." There is nothing very remarkable about these for the most part; but they are well up to the usual mark. Some of them are by well-known London makers. Messrs. Jeffery & Co., and the Lincrusta Company, have stands representing the class of work for which they are so well reputed; others are by local firms; among these a very good display is made by Messrs. Robson & Sons, cabinet-makers, of Newcastle, including a lobby, morning-room, and boudoir furnished, which are very well done, with the exception of the mistake of waxing and polishing the mosaic floor of the lobby,—a complete mistake to make in the treatment of mosaic. The boudoir has a very fine wall fabric, and a good ceiling in fibrous plaster. Messrs. Bainbridge & Co. have also a good suite of rooms in what they rather freely call the Italian Renaissance style; the title may do for want of a better; the general effect of furnishing is rather out of the common way in colour, and mostly rich and good in effect; too much blue in the dining-room upholstery. Messrs. Sopwith & Co. exhibit an "Oak Jacobean Dining-room," with some very well-executed furniture of a rather heavy type, including a black oak cabinet, made, so we are informed, from "out of part of the oak taken from the old Tyne bridge built by the Emperor Hadrian, A.D. 120,"—a respectable antiquity for any wood. Messrs. Chapman & Son's furniture is also to be commended. But the most extensive, and, in some respects, most striking native exhibits of this class are those coming from Messrs. Emly & Co., of Newcastle, Gateshead, and Glasgow. These comprise a considerable room full of furniture of various kinds, costly, and highly finished, but, to our thinking, rather handsome than artistic. Another room by this firm represents the saloon of a passenger steamer in marble; that is, a complete veneering of the bulkheads with this material. The marble work and upholstery accompanying it are in excellent taste and of the best finish, and form a curious example of the present idea of luxury in regard to the fitting of passenger vessels. But the question is, how far is this practically suitable for a ship? It must be very difficult to ensure such rigidity in the bulkheads of even the largest iron vessel, straining in a heavy sea, as would leave no chance of disturbing a veneer in a substance so rigid as marble; and, to our thinking, such a material is quite out of place on board a ship. The third exhibit by the same firm is open to no such objection. It consists chiefly of an altar and reredos of Pavonazza marble for the new Church of St. George, Jesmond. The material is a grand one, and nothing could be better in its way than the work, especially the execution of the deeply-cut floral diaper on the panels on each side of the altar. The work is from the designs of Mr. T. R. Spence, of London, and does credit both to designer and executants. Among other exhibits in the same court Messrs. Hobbs, Hart, & Co. show a steel bullion safe in one piece of steel, door also in one piece; a new method for special security; besides a number of other examples of work of the highest class of its kind. Mr. J. Farthing's very elaborate inlaid walnut cabinet deserves a special word of recognition as a very fine piece of work; and, though not quite on the same grounds, we cannot pass over the enterprising manufacturers (Rolls & Son, of London, and Coxon & Co., of Newcastle) who have challenged attention to their linoleum and floor-cloth exhibit by arranging the rolls and sheets of the material "so as to represent a Byzantine arcade!" Their stuff, as well as that of Messrs. Anderson & Lee, near them, shows some good and tasteful patterns, however.

In the West Court is a good exhibition of the work of the Royal School of Art Needlework. A considerable portion of this court is occupied by exhibits of which it does not come within our province to notice; but we may mention that there is a large exhibition of carriages of various kinds by Messrs. Proud (Carlisle), Lawton & Co. (Liverpool), Atkinson & Philipson (Newcastle), and the Institute of British Carriage Manufacturers (London). These latter exhibit, as we observe from the catalogue, a large number of drawings and engravings illustrating the progress of carriage manufacture, which ought to be of much interest, but which we were unable to spare time to examine. Various presentation carriages and harness suites are lent by the Queen, and among other carriage exhibitors are Messrs. Mason & Co. (Birmingham), Forder & Co. (London and Wolverhampton), Ridges & Co. (Newcastle), Angus & Co. (also of Newcastle), and Selby & Co. (Birmingham), who exhibit some "safety axles" and other improvements in various carriage accessories.

Machinery in motion, of which, however, there is not a very large exhibition, finds place in the West Court; this includes, however, a considerable amount of exhibits which we have not space just now to notice in detail. Among things we specially noticed as of interest in connexion with buildings is Walker's "Anti-Vibration Shutter" for air-driving fans, the principle of which consists in partially

closing the opening through which the air is propelled by two checks in the shape of long triangles, following the curve of the periphery of the fan, and leaving an opening for the air-passage in the shape of a long inverted Λ, the blast of air coming into play gradually by a kind of *crescendo* arrangement, with less marked pulsation than through a rectangular opening. A working Blackman propeller is also shown, with satisfactory results. Among materials exhibited, we noticed the blocks of Frosterley marble from Messrs. Pease's Weardale quarries, a remarkable-looking marble showing a diaper of fossil-vegetation marks on a black ground. The "North of England School Furnishing Company" have a good exhibit of various types of school furniture, including a "Hygienic Chair," fitted with an "adjustable spinal pad," to be moved up and down of the centre vertical rail of the chair back, as required by the special conformation of the sitter. Messrs. Armstrong, Addison, & Co. show a considerable number of examples of creosoted wood, including specimens that have been in use as railway-sleepers and in other somewhat similar situations for many years, and give a good account of the preservative influence of creosoting. Messrs. Walker & Son, of Newcastle, have a good exhibition of stoves and grates, and Messrs. Emley & Sons, of the same city, a large and multifarious exhibit, including door-springs, lock-furniture, hand-lifts, kitchen-ranges, &c. Messrs. Dinning & Cooke's (Newcastle) stable fittings are worth attention, especially their granite-concrete floor; and the Carron Company are well represented in ovens and cooking apparatus, especially designed for large establishments. Messrs. Craggs & Son's (Newcastle) chimneypieces and decorative work in British and foreign marbles, is a good exhibit, as also that of Messrs. Smith & Co., of Coalville (Leicestershire), of ornamental floor and wall tiles. Messrs. Duffy & Son exhibit their "unwearable" system of wood-block flooring, the pieces grooved at the sides and tenoned at the ends.

A series of "artisans' exhibits" in this portion of the exhibition is a good idea in itself, but it cannot be said that it shows in most cases anything beyond diligence and neatness in the construction of models of various kinds. Mr. G. Bain, of Gateshead, is to be credited with a well-executed model of artisans' dwellings for large towns, executed in wood; but there is no new suggestion in it. Models of engines and ships, many of them very well executed, are tolerably abundant. Among things that are more than mere models is the model by Mr. Maccallum (of Leamington, Northumberland) of an improved accommodation ladder for ships and tidal landing-stagings, in which the steps remain level at whatever inclination the ladder has to be placed, and the ladder can be lowered to suit boats at whatever draught the ship may be. This is an ingenious, and appears a practical exhibit. Mr. E. Rowe (Chilton Moor, Durham) exhibits a model of what should be a very important idea, if practical or practicable, a "coal-getting machine," consisting of "a simple wedge" acted upon by hydraulic power; "no explosives required." The model, however, is rather a sketch than an actual model; at all events, it is not sufficiently worked out in detail to enable one to judge of the feasibility of the idea, which we should rather doubt.

The "outside lean-to" or shed adjoining one side of the buildings is chiefly devoted to materials connected with building. Messrs. W. B. Wilkinson & Co. (Newcastle) have a good exhibit here, including what they call "specular granite" pavements and flaggings, a good looking material, probably capable of a great deal of wear; they show a fireproof concrete floor without iron joists to carry a safe load of 2 cwt. per superficial foot, and a concrete bar with iron inserted, carrying weights, to show its resistance to transverse strain. "The rod alone will bend with 1 cwt., the concrete alone will break with 3 cwt.; the two combined carry 6 cwt." We are quite prepared to believe this, but the value of the "preparation" would have been increased if the size and position in the concrete of the iron rod, had been shown in section.

Grindstones take a considerable place among the exhibits here, being articles of great importance in a manufacturing district. The Lumley Brick Co. show some good-looking glazed bricks; Messrs. Ferens & Love (Durham) some sanitary ware. The Norman by Brick and Tile Company show some good terra-cotta glazed ware and bricks, and Messrs. Harriman & Co. (Newcastle) show an excellent quality of bricks, sanitary pipes, and traps, &c. Messrs. Rimmington Bros. (Newcastle) are also well represented as producers of this same class of work. Messrs. R. Boyle & Co. exhibit their various ventilators. We may mention, while touching on the topic of sanitary exhibits, that there is, or was, or was to be, a model sanitary dwelling, the position of which is, indeed, shown on the map of the grounds, but which, as far as we could ascertain, was at the time of our visit unfinished, at all events not to be seen.

Among the exhibits in the North Gardens is to be seen a door giving access to the "model coal-mine," which, on being entered, introduces one to a whole catacomb of artificially-constructed low and dark passages, representing the working passages of a coal-mine; the total length of the passages, which form a kind of labyrinth dimly lighted by electric glow lamps of low power, being about 600 yards. Additional realism is imparted by the whole ground being strewed with coal-dust. But the exhibition is really an interesting one, showing the coal-wagons used, the means of ventilation, the system of support to the sides of the galleries, the manner of dealing with a "fault," &c. A similar but shorter catacomb near it illustrates in the same manner the working and characteristic features of a lead mine; and in another part of the grounds is a series of illustrations of various methods of haulage employed in mines; but how complete or instructive this is we had not time to observe.

The model of the old Newcastle Bridge is very well done, and looks very picturesque; but this kind of thing is not difficult to do when the idea is once started, as it was by "Old London"; and probably every exhibition of this kind will now contain an archæological model of this kind, and the promoters of exhibitions will create an archæology for their district even when it has none to speak of. Among other things of interest in the North Garden grounds are two temporary bridges constructed by the First Newcastle Engineer Volunteers under command of Col. Palmer; a treble sling bridge made of spars and ropes, and a floating bridge on casks. These are both made with such materials as might be found on the ground or carried with troops in the field; and they are very good specimens of temporary work of the kind, put together with rough materials, but in a perfectly workmanlike manner.

The fine art section is the least important part of the Newcastle exhibition, containing, indeed, a considerable number of drawings and paintings, but of which the average merit and interest are not very high. There are some great paintings scattered up and down among them, however, of which the most noteworthy are Crome's grand views of Carrow Abbey (722) and "Bruges" (728), the latter a moonlight, an unusual subject with Crome; Mr. Watts's "Creation of Eve" and a second edition of "Love and Life"; Mr. H. Moore's grand sea-shore painting, "The Beached Margin of the Sea" (758); Corot's "Dawn" (881), one of the greatest works he ever painted; Mr. Alfred Hunt's "Durham" (916), and Mark Antony's "Night Storm and Darkness" (773), the old picture of the big tree, under a new name. There are other lesser works by well-known names (Mulready's "Careless Messenger" it is interesting to meet with again); and several very good paintings bearing names not familiar to us, but not the less welcome on that account.

Imperial Institute.—We understand that Mr. Collcutt's design for the Imperial Institute is accepted; as far as we can ascertain, there appears no doubt of the fact, though we have seen no official announcement of it. The Queen is to lay the foundation-stone on the 4th of July.

Exhibition of Mosaic Work at Venice. Attention has been called by the Continental press to the Art Exhibition at Venice, one of the most interesting features of which is a mosaic executed by Dr. Salviati for the Loggia of the Dusseldorf Kunst-Halle.

The New Law Courts, Birmingham.—The contract for the Victoria Law Courts, Birmingham, of which the Queen laid the first stone some weeks since, is assigned to Mr. John Bowen, of that town. His tender was for 78,869*l.*

A DUTCH DESIGNER.

BOLTEN VON ZWOLL.

IN this, the concluding article of the series* which we have devoted to the early engravers who worked chiefly in France and Germany, and who flourished from the fifteenth to the seventeenth centuries, we hope to serve some useful purpose by glancing rapidly through the work which we have illustrated, and by gleaning therefrom a sheaf of those elementary principles on which the art of those old designers was built, and which are too often ignored by the designers of the present day.

With the exception of those precursors of Albert Dürer noticed in our first article published on December 5th, 1885, it will probably have pleased some of our readers to adopt one broad classification for all the artists whose work we have passed under review. There are those for whom all ornament, or at least all the ornament of Central Europe, is either Gothic or Renaissance; and by far the largest proportion of the works we have sketched will by them be generalised, at the best, as interesting specimens of the Renaissance. It seems to us that mere broad generalisation can serve but little good unless we go further and dissect the work which the influence of the Renaissance called into existence. One thing this influence did was to foster a servile imitation of the classical models, to produce through all succeeding time a multitude of copyists whose work was as blemished as the models were themselves; copyists who ignorantly reproduced the faults of the Roman workmen, and in the reproductions made them infinitely more faulty. The imitators rapidly formed a school of their own, producing work characterised by the same methods, the same devices, and the same tricks as the Roman antiques, which served for models. It is this work specially which we have termed Renaissance work, and the faults of which we have so frequently and without hesitation pointed out. It is not to be wondered at that among the students in this school some should have been found of originality and skill sufficient to produce some very charming work, in which the blemishes of style were reduced to a minimum. Such men were Altdorfer and Aldegrever in early days, and Pierre Bourdon in the beginning of last century; but the very excellence of their work only serves to emphasize the villanies perpetrated in the name of the Renaissance by a lower order of beings who are with us even to this day. But of this lower order we feel that we have already said enough. And we may turn with a feeling of relief and satisfaction to the influence for good which may undoubtedly be attributed to the Renaissance.

That influence for good was, as has been often said, a revival of the search for principles. Many of the unearthed examples may have been bad, but at least the principles on which they depended were of the highest excellence. With such of the principles as related to decorative art we are now perfectly familiar, and here it is necessary only to mention them briefly. They involve the complete ascendancy of the conventional over the realistic; the complete dependence, nevertheless, in certain cases, of the conventional on natural forms and principles of growth and structure, *i.e.*, in the tangential flow and radiation of the lines of design; the proportion of all parts of the design to each other; and the even covering of the space or surface ornamented.

In the first and foremost of these lies the spirit of true conventional work, and from the study of the methods of conventionalising adopted by the Classic artists came the power of conventionalising other natural forms, and of breaking away from the use of the eternal acanthus-leaf on every occasion, whether appropriate or inappropriate. It must be confessed, however, that the Gothic designers, when they make use of foliage decoration, are not much freer from the charge of artistic tautology than the servile copyists of the Classic models. To many, though not to all, minds the Gothic serrated leaf possesses charms as potent as those of the Classic acanthus. It is not so

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* The following is a complete list of the series, with the dates on which they have appeared:—1885; Dec. 5, The Precursors of Albert Dürer; Dec. 12 and 19, Albert Dürer and his Followers. 1886; Oct. 30 and Nov. 6, Hans Holbein. 1887; Jan. 1, Jean Bourgnet; Jan. 8, Pierre Bourdon; Jan. 15, Herbst, Le Blond, and Gentsch; Jan. 22, A Cluster of Decorative Artists; Feb. 5, The Two De Brys; Feb. 19, Some Unknown Designers; April 23 and 30, Some Designers of Grotesques; June 4, Virgilius Solis; and the present one on Bolten von Zwoll.

cumbersome, and consequently lends itself more easily as an ornament to the flowing curves of a design; but there must of necessity be a feeling of monotony attending its too constant use. In the varieties and modifications of it which make Israhel von Meckenen's work (treated at length in our issue of December 5th, 1885) so charming, we find this Gothic leaf in its least rigid form. In many instances Von Meckenen's foliage is, as it were, the connecting link between the Gothic and the Classic styles.

In the same way that Von Meckenen broke away from the severe Gothic models and produced conventional floral designs of striking originality, did many artists in later days, after imbibing the principles which the Renaissance brought prominently to the front, break away from the perpetual use of the one model with which it supplied them. The three-petalled leaf which appears so frequently in Altdorfer's and Aldegrever's panels (see our issue of December 12, 1885) is a good example of this original work. Its curves are always exceedingly graceful, and when multiplied to make the corolla of a flower give a very charming result. In Aldegrever's panels additional variety is obtained by frequent introduction of the side view of this leaf. This leaf reappears in a simpler form and with less surface modelling in some of Bourdon's work, together with some more complicated variations (see our issue of January 8, 1887, more especially the scent-bottle or handle, fig. 12).

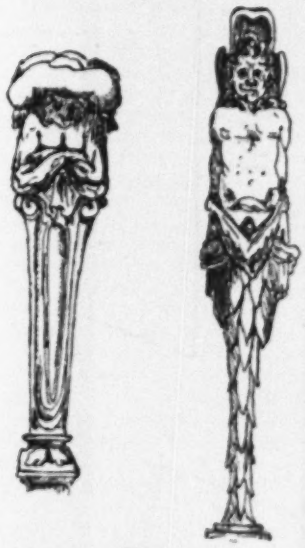


Fig. 1.

Fig. 2.

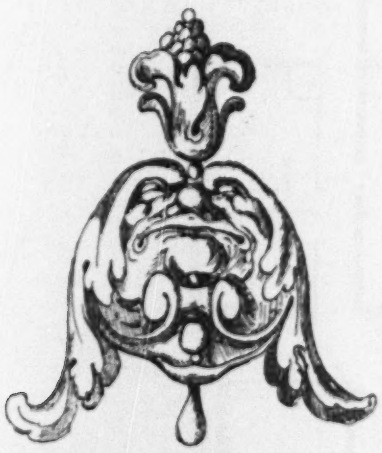


Fig. 3.

Fig. 4.

In the monkey-panel (figured in our issue of February 19, 1887, on page 279), by an unknown German engraver, we find the leaf of the black bryony treated in a rigidly conventional manner. The quaint and irregular serration of these leaves, which, hanging from the vines, add to the countless beauties of every wayside hedge, make them in conventional form specially serviceable to the decorator. It is a wonder that they are not more used. We have seen them very effectively treated in plain gold on a delicately-tinted diapered background, with here and there a brilliant scarlet berry. Then there is the flower-scroll (fig. 6 on the same page) on whose originality and beauty we have already dwelt.

In the best work of the younger Theodore de Bry (see our issue of Feb. 5, 1887) we noticed what great power that artist showed in conventionalising natural forms which hitherto had not been pressed into the decorator's service: notably the seed-pods of a papilionaceous plant open, half-open, or shut, and in segment. Once more we find the principle carried to its utmost limits in the charming floral designs of Herbst (see our issue of Jan. 15, 1887). But instances might be multiplied without end: those we have given are sufficient to show what the chief influence of the Renaissance really was on decorative art, and in what direction it worked: notwithstanding the bad work so often alluded to, that influence is with us as great to-day as it was when it first sprang into existence, and was endowed with vitality by the discovery of the great antiques which lay for so many hundreds of years beneath the Italian soil.

Of the remaining principles which concern the structural formation of a design we have already spoken at sufficient length and with sufficient emphasis in our former articles; it is unnecessary to dwell on their characteristics again, though we may without fear of wearying our readers repeat that their recognition is essential to good and perfect ornament.

To-day we present our readers with a few sketches of some curious designs from the hand of an unknown Dutchman,—Bolten von Zwoll. They are taken from a large collection of the original drawings pasted into a folio scrap-book in the British Museum Print-room. Beyond the facts that the book passed into the Museum from the Earl of Arundel's collections; that the drawings, to the number of about 300, were probably got together by the Earl; and that the date impressed on the cover is 1640, nothing is known about them, nor of Bolten their producer.

We give the sketches to-day more as curiosities than as first-rate specimens of decorative art. They are essentially Dutch, and none of the designs can be said to possess any very great beauty; but, albeit somewhat grotesque, they are strikingly original, and show a most remarkable force and purity of outline. In fig. 1 are two quaint pilasters. Fig 2 is one of a large series of lamps and tazzas, all of which are very charming in form. Fig 3 is a very boorish grotesque, probably designed for the bosses of a cup; there are a great number of these grotesques, the faces of the men and animals being full of a Batavian grace and humour, which makes us regret that our space for sketches is but limited. In fig. 4 we have sketched the largest of three or four designs for silver cups: the outline is vigorous and well proportioned; and, if we omit the portly *frau* and the bunch of fruit, the ornament is simple and in good taste. In the chasing of the base will be seen the better half of a Batavian face much resembling that depicted in fig. 3, and pointing the uses to which these fantastic figures were put by their prolific designer, Bolten von Zwoll.

In concluding this series of articles we cannot fail to express our thanks to Professor Colvin, to Mr. Fagan, and to their many assistants in the British Museum Print-room for the unwearying attention and unfailing courtesy which they have shown us during the pleasant hours spent in foraging among the priceless treasures committed to their care.

Illustrations.

REREDOS, LANGPORT CHURCH.

THE reredos for this church, in the neighbourhood of Taunton, has been executed by Mr. G. W. Seale, from the designs of Mr. J. D. Sedding. We gave a full description of it in the *Builder* for March 12th of this year, page 409.

MONUMENT TO THE LATE BISHOP OLLIVANT.

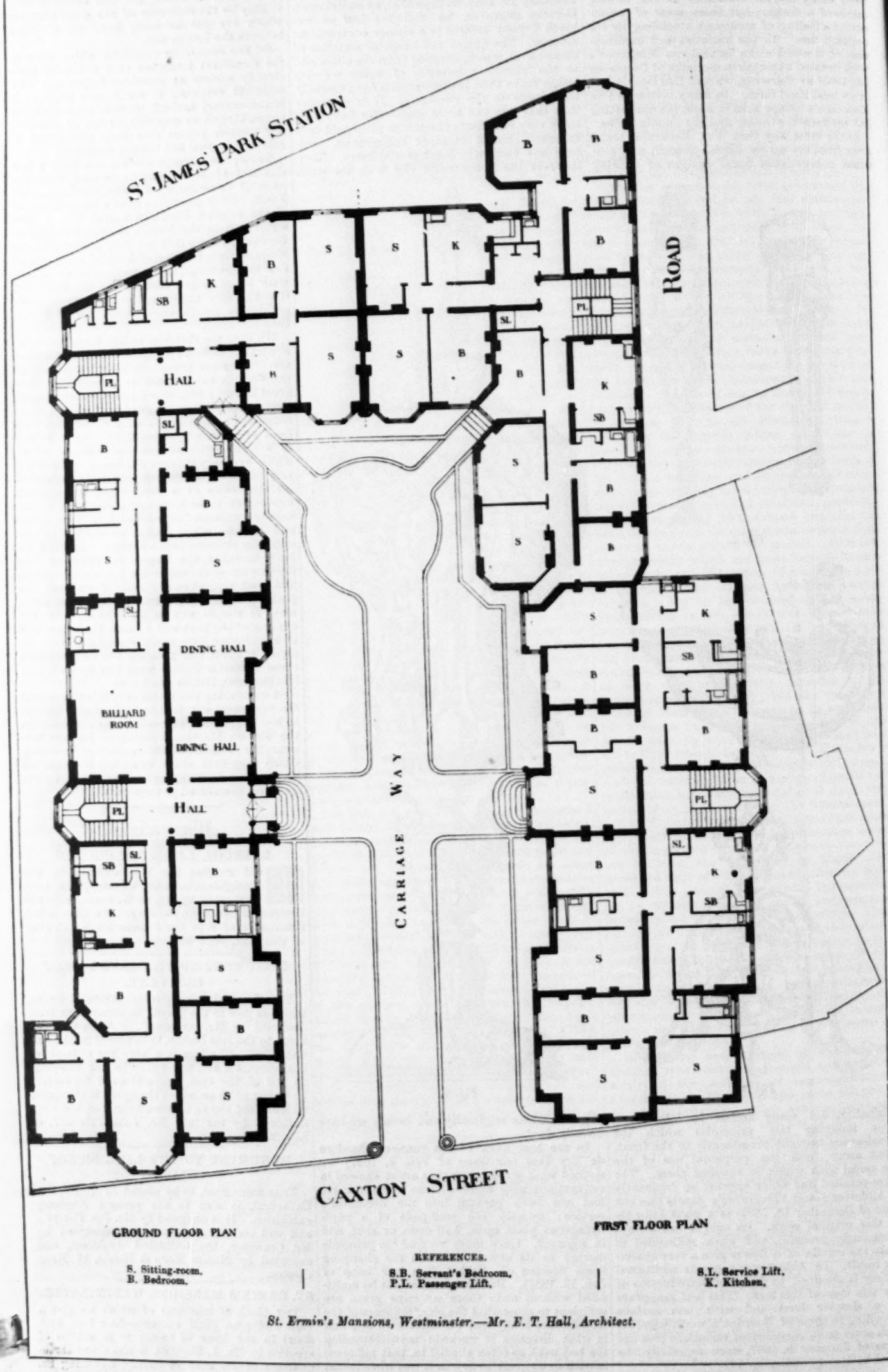
THIS fine and expressive monumental figure, which is now in the Royal Academy, has been designed by Mr. Armstead, R.A., as a monument to the late bishop, to be placed in Llandaff Cathedral. The face is a very fine example of the sculptor's art, and ranks, to our thinking, as one of the best productions of its author. The altar tomb on which the figure is to repose, which is not shown in our illustration, has been designed by the late Mr. John Prichard, of Llandaff.

MONUMENT TO THE LATE BISHOP FRASER.

THIS monument, to be placed in Manchester Cathedral, is also in the present Academy exhibition. It is designed by Mr. Jas. Forsyth, and will rest on an altar-tomb designed by Mr. Crowther, the Cathedral Architect, and executed by Messrs. Earp & Hobbs, of Manchester.

ST. ERMIN'S MANSIONS, WESTMINSTER.

THE block of mansions of which we give a view and plan (half entrance-floor half first floor) in our issue of to-day is in course of erection by Mr. A. Steer on a site about three-quarters of an acre in extent, adjoining St.



GROUND FLOOR PLAN

FIRST FLOOR PLAN

REFERENCES.

S. Sitting-room.
B. Bedroom.
S.B. Servant's Bedroom.
P.L. Passenger Lift.
S.L. Service Lift.
K. Kitchen.

St. Ermin's Mansions, Westminster.—Mr. E. T. Hall, Architect.

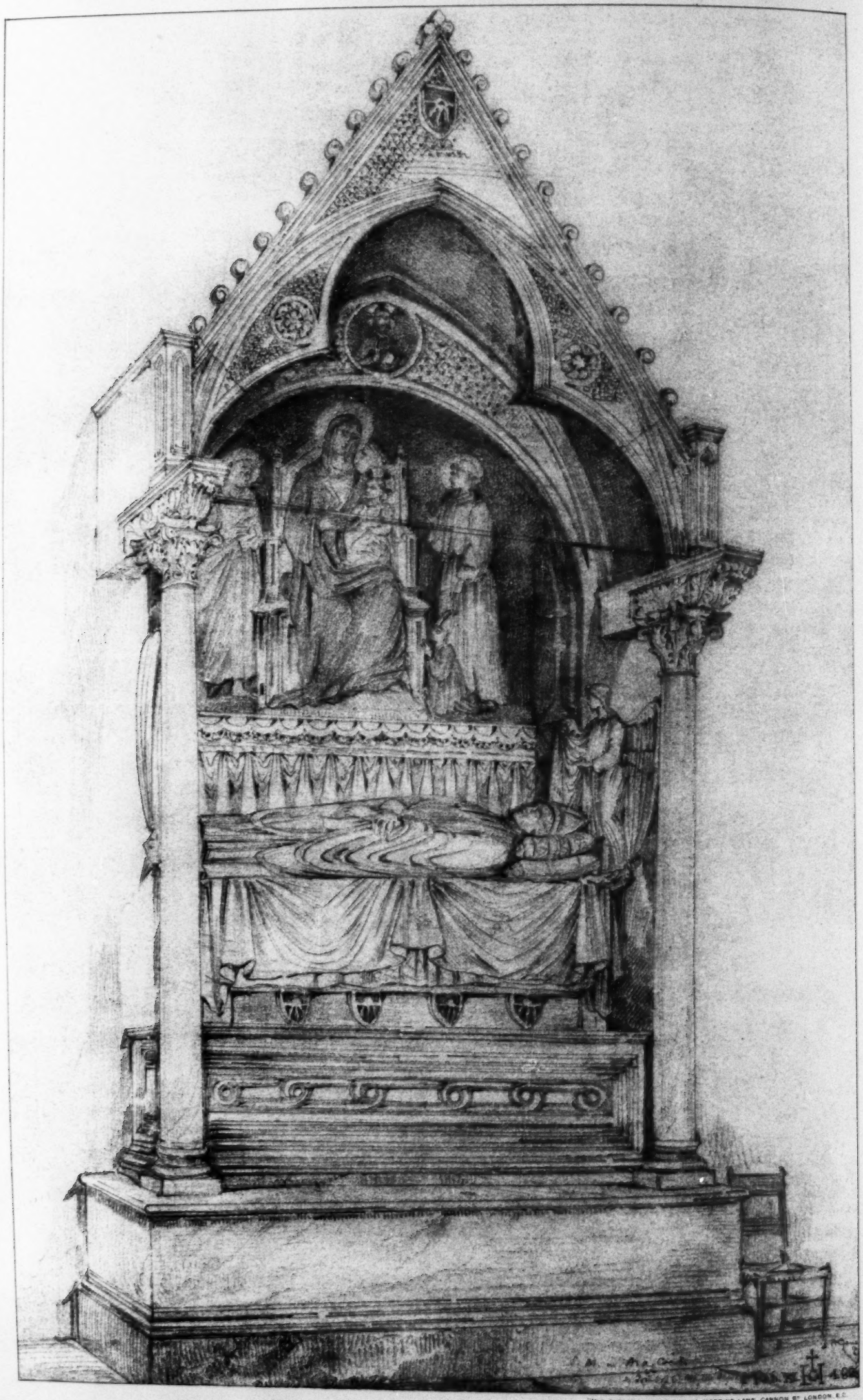
PHOTO-LITHO. SPRAGUE & Co. 22. MARTINS LANE CANNON ST. LONDON E.C.

F.R.I.B.A., ARCHITECT.

ST. ERMINS MANSIONS, WESTMINSTER.—M

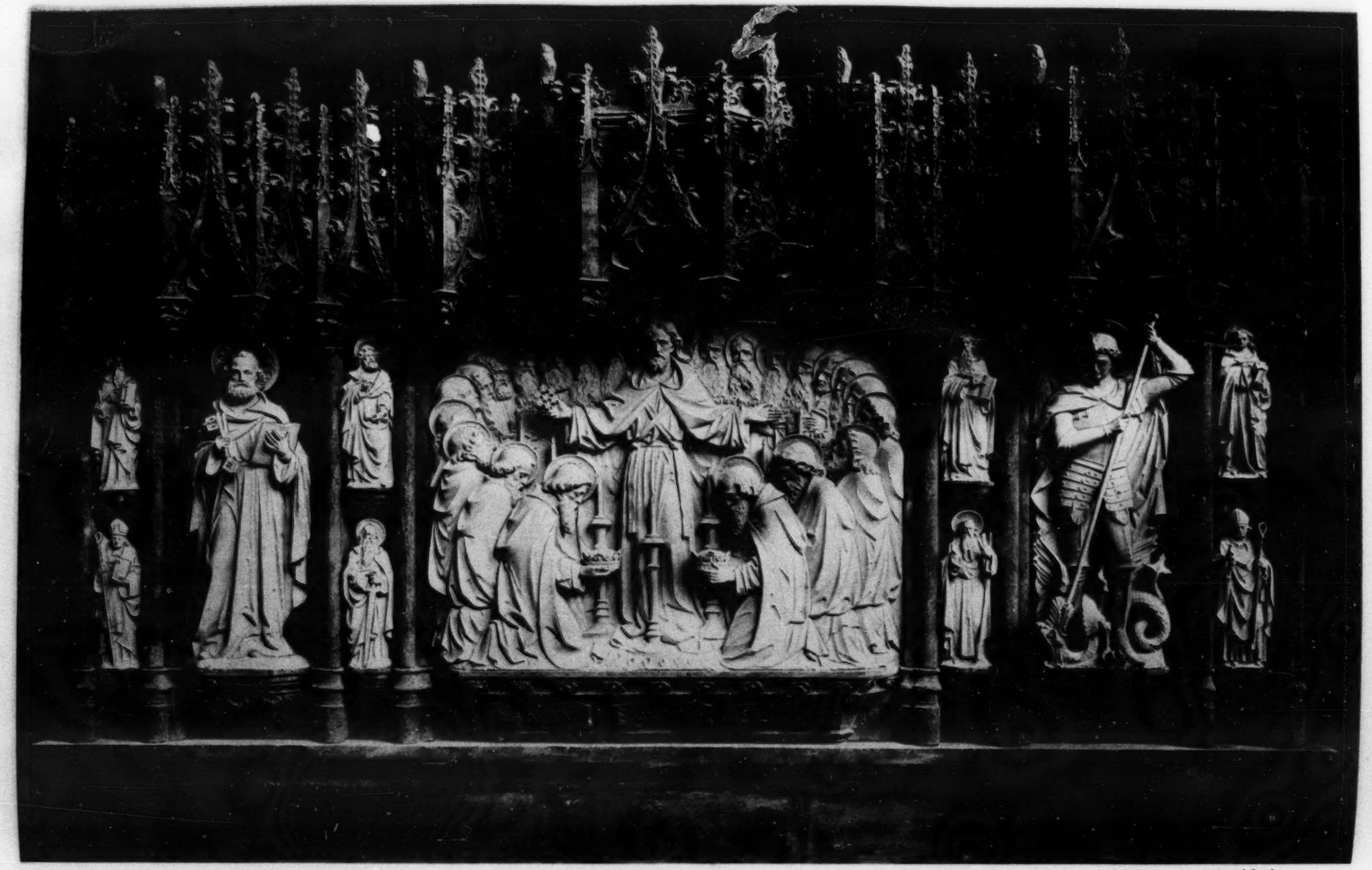
PHOTO-LITHO. SPRAGUE & Co. 29, MARTINS LANE, CANNON ST. LONDON E.C.

—Mr. E. T. Hall, F.R.I.B.A., Architect.



INK-PHOTO: SPRAGUE & Co. 28, MARTINS LANE, CANNON ST. LONDON, E.C.

TOMB IN S.M. IN ARA COELI, ROME.—Drawn by Mr. Gerald Horsley, Aldwinckle Student, 1887.



The Phototype Co., 308, Strand, London.

REREDOS, LANGPORT CHURCH, TAUNTON.—Mr. J. D. Sedding, Architect; Mr. G. W. Seale, Sculptor.

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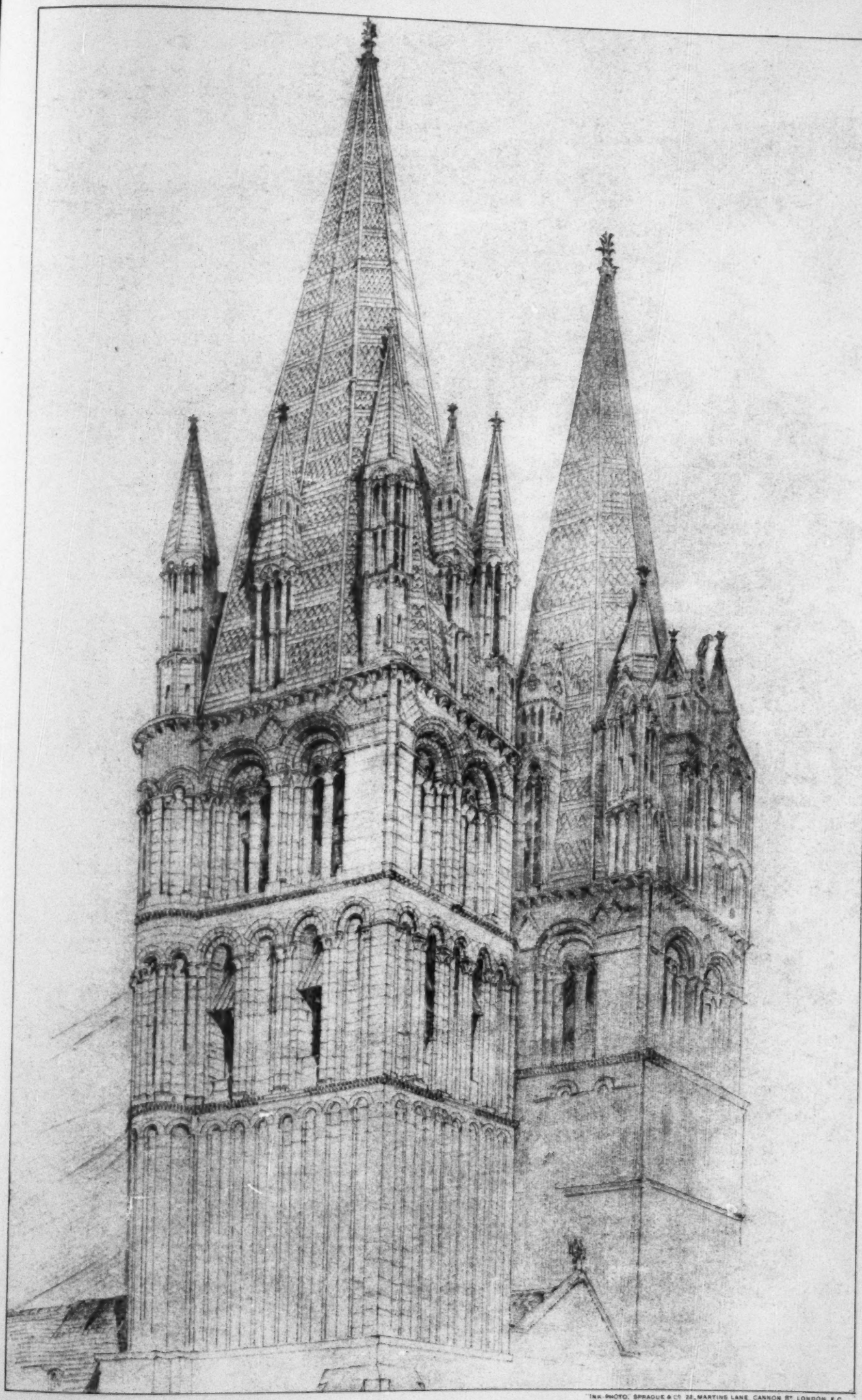
MONUMENT TO THE LATE BISHOP FRASER.—Mr. Jas. Forsyth, Sculptor.

The Phototype Co., 308, Strand, London.

MONUMENT TO THE LATE BISHOP OLLIVANT.—Mr. H. H. ARMISTEAD, R.A., Sculptor.



INK-PHOTO, SPRAGUE & CO. 22, MARTINS LANE, CANNON ST, LONDON, E.C.

THE WESTERN TOWERS OF THE CHURCH OF THE ABBAYE AUX HOMMES, CAEN.

Drawn by Mr. Gerald Horsley, Aldwinckle Student, 1887.

James's Park Station and the Westminster Town-hall. The main frontage is to Caxton-street, parallel with Victoria-street, from which it is separated by the garden of Christ Church, the Hotel Windsor being to the right and Members' Mansions to the left.

It will be seen that the building forms three sides of a quadrangle, open on the fourth side to the south, the centre being laid out as a private garden for the use of the residents,—a feature unique in London as attached to residences "in flats."

The view was drawn from the preliminary design, and considerable alterations have been made in the actual working drawings from which the plans are copied.

The whole range is constructionally divided into four blocks, each having a spacious hall, large staircase, and hydraulic passenger and service lifts. For convenience of supervision, and as an additional means of escape in the event of fire, there are corridors for communication between all the blocks on the sixth and lower ground floors.

The buildings are divided into suites of from two to nine rooms, each having its own private entrance, bath-room, and water-closet, with store-closets, and in the larger suites its separate kitchen and larder, and servants' water-closet.

To each pair of blocks is attached a staff kitchen, 36 ft. by 19 ft. (with a complete set of offices), in close proximity to the service lifts, enabling the management to undertake, as in a hotel, for all or any of the tenants who may desire it, the entire culinary and other domestic service.

There are also public dining-rooms, billiard-rooms, &c., for the use of tenants and their friends.

Residences for housekeepers and bedrooms for a number of house servants are also provided.

The staircases and floors throughout will be of fireproof construction. Special attention will be paid to the sanitary arrangements, including the ventilation, automatic flushing, and provision of means for inspection of drains. All rain-pipes and bath and sink wastes will be disconnected from the drains. The window areas generally are large, to make the rooms bright and cheerful.

It is proposed to supply the buildings with pure water from an artesian well on the premises, sunk deep into the chalk.

The site possesses the advantage of being in the heart of Westminster, in close proximity to the Houses of Parliament, the park, clubs, &c., while it is retired from the noise of a main thoroughfare.

The estimated cost of the building, exclusive of the land, is about 80,000*l*. The architect, from whose designs and under whose superintendence the work is being carried out, is Mr. Edwin T. Hall.

TOMB OF CARDINAL MATTEO OF ACQUASPARTA, IN THE CHURCH OF S. MARIA IN ARA COELI, ROME.

THIS tomb stands in the north transept. It has no inscription upon it. The Cardinal died in 1302, and mention of him is found in Dante, where he is spoken of as the General of the Franciscan Order, wise and moderate in his rule.

The representation of the Madonna with the two monkish saints is in fresco, as well as the small head of Christ, and the underside of the arch.

The spandrels, coats of arms, &c., are in mosaic. The colour of the marble is very beautiful and delicate. On the drapery is carved diaper work. In Santa Maria Maggiore is a somewhat similar tomb, signed and dated Johannes Cosme, 1299, but the picture of the Madonna is in mosaic. G. HORSLEY.

WESTERN TOWERS, ABBAYE AUX HOMMES, CAEN.

THE spires to these towers (*temp.* William the Conqueror) were added in the thirteenth century. G. HORSLEY.

Truro.—St. George's Schools are about to be considerably extended. The alterations include the erection of a new infants' school which will accommodate over 100 children. Mr. A. H. Clemens, of Truro, is the architect.

CANONS, MIDDLESEX.

"At Timon's villa let us pass a day,
Where all cry out, 'What sums are thrown away!'
* * * *
Who then shall grace or who improve the soil?
Who plants like Bathurst or who builds like Boyle.
'Tis use alone that sanctifies expense,
And splendour borrows all her rays from sense."
POPE, "Moral Essays," Epistle iv.

WE have adverted as occasion arose to the purchase of the Jervaulx Abbey Estate,* and the projected sale of Walpole's seat at Houghton, county of Norfolk,—which latter property was withdrawn by Sir J. W. Ellis on a highest bid of 300,000*l*., at the auction of the 27th of July last year. Next month another historic property will be put up for sale by auction, by direction of the trustees under the will of the late Dr. Begg. We speak of Canons, famed for its associations with Handel, Pope, and the "magnificent" Duke of Chandos. Being now some 600 acres in area, the property lies within Whitchurch, or Little Stanmore, parish, which extends over about 1,570 acres of Gore Hundred, Middlesex. Distant eight miles and a half from the Marble Arch, the estate stands on the verge of the great northern forest, whereof we still find vestiges at Enfield Chace, Epping, and Waltham. Its eastern boundary rests against the straight high road,—Watling-street, and perhaps a former British causeway,—through London to Caswallon's fastness of Burgha's Wood (Brockley Hill), the Sulloniacæ of Antonine's Itinerary; and thence to Verulamium and the tracts of the Cassii. In proof of the main road's antiquity we may here observe that its middle line separates the parishes of Kingsbury and Hendon, and of Whitchurch and Edgware or Edgworth. Lysons tells us that the manor in Stanmore Parva, which had been held by Algar, servant to Earl Harold, belonged in the Conqueror's time, as is recorded in Domesday, to one Roger de Raymes. The Raymes family owned wide lands in Essex, constituting a barony. At the marriage of King Henry III.'s sister Isabel to Frederic Emperor of Germany, "half a knight's fee was paid by Henry Bocoynte for his lands in the parish of Stanmore Parva, held of the barony of William de Raymes." This property next passed to the prior and canons of St. Bartholomew-the-Great, West Smithfield, from which circumstance its name, like to that of Canonbury, is commonly deduced. Yet many derive it from a religious house or chauntry that had been established on this spot in connexion with Bentley Priory at Stanmore. However this may be, Canons in 1544 was given to Hugh Losse,† under the style of "the Manor of Canons and Wimborough in the Parish of Whitchurch." The Losses were succeeded, or joined, in possession by the Franklyns, *temp.* Elizabeth. Yet it was a Sir Hugh Losse who sold the estate to Sir Thomas Lake, Secretary of State to King James I., and who died here on October 19th, 1630. Sir Thomas's granddaughter and heir brought the property in marriage, on February 27th, 1697, to James (Brydges), ninth Baron Chandos of Sudley Castle, who, on April 30th, 1719, was advanced Duke of Chandos. His Grace's house derived from the Montgomerys, Earls of Arundel, and could boast descent through the Tudors and Plantagenets.

In 1712 the Grand Duke, as he was locally designated, had begun to build, and in a style seldom attempted before, a mansion whose memory chiefly lives in Pope's trenchant albeit inaccurate and ungrateful satire. Its total cost, including that of the park and gardens, amounted to nearly one million sterling of our present money. For architects he employed Gibbs, Shepherd, and James. The pleasaunce, with its lake covering seven acres, and fishing temple, was laid out by Dr. Alexander Blackwell.‡ No adornment was spared for the interior. Thornhill painted the ceilings; even the door-locks and hinges were of silver or gilt. Constructed of stone, the house was square in plan, set diagonally before an avenue of elms. Each of the four front elevations had three rows of eleven windows with a sculptured head above every opening. The principal front had a row of six fluted columns, in marble, standing on a rusticated base, ascended by steps. The pediment covered heraldic achievements, trophies, and so on. The outer walls were 12 ft. thick at the base, diminishing to 9 ft. at the ground-floor. The celebrated main staircase now owned by Lord Burton, of Chesterfield House, May Fair, is built of blocks of white marble, 22 ft. in length. The balustrade was of silver.* Two lodges by the main road gates are of a design to correspond with that of the house. The long avenue reaching northwards from Sir Lancelot Lake's Almshouses (1656), by the church, is now a wilderness, interspersed with firs, beeches, and pines, and traversed by a winding path. Traces exist of the private road which, as the story goes, the Duke planned into London. He wanted to pass over his own land in riding between Canons and the town mansion that he proposed to build in Marylebone Fields along what is now the northern side of Cavendish-square. Of this house the eastern wing stands at the corner (north-eastwards) of the square and Chandos-street. A view of its entire elevation, after John Price's design (1720), is preserved in our national collection, British Museum. The Duke, by the way, was twice attacked by highwaymen along this same road, and on two successive days, Monday and Tuesday, February 6th and 7th, 1720, as stated in the *British Gazetteer*.

Various anecdotes survive of the Duke's precautions against improvident profusion in his plan of living. He used to sell such garden fruit as was not required for his own table,—"It is as much my property," said he, "as the corn and hay and other produce of my fields." An aged man who had been his servant was wont to tell how his occasional bounties to the labourers never exceeded 6d. at a time. "This," he would say, "may do you good; more may make you idle and drunk." He engaged an able accountant,—one Watts,—to settle a scheme of household expenditure with totals for a year, a month, a week, and a day: the particulars being engraved on a large copper-plate. On the other hand, we have testimony by the author of a "Journey through England" to the Duke's sumptuous order of service at table; his stately progresses to and from chapel escorted by a band of pensioner sergeants equipped as Yeomen of the Guard, his regal choir of vocal and instrumental music at the parish church. The vast fortune he had amassed when Paymaster-General to the Forces under Queen Anne suffered three shocks by his concern in the African Company and the South Sea and Mississippi schemes, 1718–20. Yet he lived on in scarcely diminished splendour at Canons until his death on August 9th, 1744. His son and successor, Henry, had married, 21st of December, 1728, Mary, daughter to Charles (Bruce), third Earl of Ailesbury. Lord Ailesbury, as trustee for his son-in-law, found the estate, already encumbered, to be quite unequal to the charge of such a costly inheritance. So he determined to sell the property, and, failing a single purchaser for the whole, in separate lots. The sale (1747) did not realise more than a net amount of 11,000*l*. Relics of the house were scattered over the country. Lord Chesterfield bought the hall staircase for his new house at May Fair; its silver balustrade, and the main portico, went to Lord Tilney's seat (Wanstead House); the equestrian statue of George I. was taken to form the ornament, though in our day it became the ridicule, of Leicester-square; a marble mantelpiece was bought for the Goldsmiths' Hall. Some of the stained glass was removed to Witley Court. It is said that the two stone houses on the northern side of Cavendish-square were built out of one lot of materials; with the materials of another lot the purchaser, Mr. Hallet, a cabinet-maker, of Long-acre,—who also bought the land,—constructed the existing house, on a site close to that of the original residence. William Hallet, his grandson, parted with the property to Colonel O'Kelly, the wealthy owner of Eclipse, which famed racehorse and sire was buried within the grounds. A nephew of Philip O'Kelly, the colonel's brother and heir, sold the property to Sir Thomas Plumer, Vice-Chancellor of England and Master of the Rolls. Meanwhile, James (Brydges), third and last Duke of Chandos, had died leaving a daughter and sole heir, Anna, who on April 16, 1796, married Richard (Nugent-Temple-Grenville), second Marquess of Buckingham, advanced February 4, 1822, Duke of Buckingham and Chandos.

In 1715-20 the Duke of Chandos rebuilt of pale red brick the nave and chancel of the parish church, which had been dedicated to St. Lawrence, *temp.* Henry VIII. The register

* The *Builder*, February 26th, 1887.

† The initials R. L. [Robert Losse] above crest and coat-arms are carved on a mantel-piece that was taken from the Chandos Arms,—now, alas! "hotel,"—the supposed manor house.

‡ *Gentleman's Magazine*, September, 1747.

* *Vide* Virtue's account in a MS. owned by Lord Orford at Strawberry Hill.

dates from 1558. In mute protest against the parishioners' greed, he left the Gothic tower. This, having battlements and a north-eastern turret, is stuccoed over, and defaced with an Italian, or Classic, doorway in stone. Taking for model a royal chapel at Versailles, the Duke engaged the labours of Belluchi, of Laguerre and Verrio, and of Gibbons and his father-in-law, for the paintings, carvings, and ironwork with which the church's interior is so profusely decorated. Setting aside the carving and ironwork, and perhaps one or two of the coloured paintings, the general effect of the interior, enforced as it is by the fresco Evangelists, Saints, and Virtues, and the sham columns, arches, pavements, &c., on the walls, is to our mind that of a Vauxhall by daylight. The altar stands beneath a curved pediment, which is supported by a pair of coupled columns and pilasters,—the work of Gibbons, and of oak grown in the grounds. In a lighted recess behind this, and itself flanked by the "Adoration" and the "Glory," is the organ, by Father Schmidt, its case by Gibbons, also. Subject to certain enlargements of 1878, this is the instrument on which Handel played whilst resident chapel-master at Canons, 1718-21. With Handel's greater name should be cited, too, those of Dr. Randall, of Cambridge; Dr. Pepusch, whose morning and evening services were long used; and of Savage and Beard, in the choir. In a southern window is a brass tablet to the memory of Sir Harry Smith Parkes, who died at Peking on March 22nd, 1885. The Chandos memorials are in two chambers next north of the nave. Of these, the inner one is on a higher level than the outer; it covers the vault wherein lie the remains of the Duke, some of his descendants, and other members of his house. In the outer room rest his banner and coronet, ranged over the flight of steps which cover the vault door. Around the painted walls are fixed numerous hatchments, conspicuous with the emblazoned cross saltire, *gules* on *or*, of the Bruces, and the cross *sable* with loggerhead, *gules* on *argent*, with the motto "Maintien le droit" of Brydges. Facing the steps is the great duke's large but commonplace monument. Supported by kneeling figures of Mary Lake and Cassandra Willoughby, two of his three wives, he stands in full-bottomed wig and conventional Roman attire,—an ambitious but poor performance withal. Amongst his titles of honour are those of Chancellor of St. Andrew's University, High Steward of Cantremelenith, and Ranger of Enfield Chace. Much of the marble in this "Monument Room" is turning green; the ceiling is out of repair, and the stains of trickling rain-water do not improve Verrio's painted columns, arches, &c. By the doorway which opens into the rectory-garden stands a tombstone, on which are carved in relief an anvil and hammer with initials "W. P.," intertwined in a bay wreath, under a musical stave with notes B and E, being the opening notes of a well-known melody. The stone is thus inscribed:—"In Memory of /William Powell/ the Harmonious Blacksmith /Who was buried 27 February, 1780/ Aged 78 years./ He was parish clerk during the Time/ the Immortal Handel/ was organist of this church/ Erected by Subscription/ May 1868." Powell's reputed smithy, wherein Handel, taking shelter from a storm, heard him singing a German air at his work, stands on the western side of the main street; it is now the sweep's stable, and goes with the premises hard by. After some difficulty we succeeded in identifying Powell's home with the Bee Hive public-house, a few yards distant, its front defaced with stucco. The house is some 300 years old; the landlady told us she is endeavouring to re-purchase the board which formerly distinguished it as the blacksmith's residence. A few good subjects for the artist's pencil may be found in the town of Edgware, particularly some quaint little shop-fronts by the forge, the church tower, and the Old George tavern and Chandos Arms.

Nonington, Kent.—The church here is about to undergo restoration under the supervision of Mr. Ewan Christian. The chancel was restored some few years since, leaving the nave and north aisle yet to be done. Chiefly owing to the munificent donations of Mr. Plumptre, of Fredville Park, and Mr. W. O. Hammond, of St. Albans, these are now to be taken in hand, which include new roof to the nave and restoration of the north aisle roof, and reseating the body of the church. Mr. Wise, of Deal, is the contractor.

MACHINERY AT THE MANCHESTER EXHIBITION.

(SECOND NOTICE.)

A VERY fine display of electric lighting is to be seen in Manchester, the directors of the Exhibition having profited by the experience gained at previous Exhibitions in London and elsewhere. The installation of arc lights is carried out almost entirely by the Anglo-American Brush Electric Light Corporation (Limited), London, and the incandescent installation by the Manchester and District Edison Electric Light Company (Limited). The Anglo Brush Company supply no fewer than 546 arc lamps; of these 476 lamps are used inside the Exhibition buildings, or one to about every 1,254 square feet. The brush dynamos supplying the current are of three sizes, feeding 15, 25, and 35 lamps each. The current is distributed by conductors carrying 50 lamps to a circuit.

Messrs. Mather & Platt, of Salford, have in operation two 500-light Manchester dynamos and two 800-light Edison-Hopkinson dynamos. These are constructed by the exhibitors. The illumination of the fountains is undertaken by Messrs. W. & J. Galloway & Sons, of Manchester; the lights placed below the water consist of 18-arc lamps, arranged in groups of two lamps of 60 ampères each. These are fed by two Siemens B 13 dynamos.

The gardens are illuminated by arc lights, and oil or fairy lamps arranged in the shrubs and grass. The arc lamps are suspended from lofty hollow masts, and are raised or lowered by ropes and a winch placed inside each mast.

The incandescent lighting consists of some 4,000 Edison-Swan 16 c.p. lamps, and use the Swan curled filament. They are fitted into brass sockets, and opal shades are used to reflect the light downwards.

Safety fuses are fitted at various points to get rid of any excess of current that may arise. The lighting of each room in the picture annexes is sub-divided between two different mains, so that should there be a breakdown in one circuit the rooms would not be left in darkness. Many of the lights are placed amongst foliage or softened by glass shades of different colours. The effect in some instances is extremely good.

Amongst other dynamos in use is a large 500-light one by Elwell-Parker: this is a slow-speed compound wound one.

The electric lights are generally extremely steady and good, and individually equal to any we have seen; but as a show the effect of the garden illuminations is certainly not equal to the recent Colonial Exhibition in London.

Pumping Machinery. — The Worthington Pumping Engine Co., 114, Queen Victoria-street, London, exhibit, amongst others, a compound steam pump. This is designed more particularly for use in countries where fuel is expensive. Two steam cylinders are fitted and are so arranged that the steam having acted for the full length of the stroke of the small piston, expands on to a larger one, which works in the opposite direction, and so the return stroke is made. A feature of all the Worthington pumps is the employment, for a steam-valve, of an ordinary slide-valve working upon a flat face over ports or openings similar to those used in most steam engines. The motion of the valve is produced by means of a vibrating arm, which swings through the whole length of the stroke. It is claimed for this arrangement that greater certainty of action than steam-moved valves is obtained, and the blow inseparable to the tappet system is done away with. The plunger works through a deep metallic packing ring. The details of these pumps have been well thought out, and all the working parts are readily accessible for adjustment or repair,—an important point sometimes lost sight of. Where high-pressure steam is available this compound pump should be worked with economy. A neat form of water-meter, a low-service steam pump, and several boiler feed pumps are also to be seen here.

Amongst others a long-stroke double-ram pump known as the "Manchester" is exhibited by Messrs. Frank Pearn & Co., Manchester. It is designed chiefly for use as a fire-engine; it is of vertical type and has its main frame with pedestals for carrying crank-shaft cast in one piece. The chief feature of this engine is the length of stroke obtained, which is considerably longer than is usually found. It appears that in a recent trial at Ashton-under-Lyne a pump of this make with two 7 in. rams and two 10 in. steam cylinders, with a stroke of 14 in., a speed of ninety-two revolutions, and 150 lb. pressure, threw 1¼ in. jet of water 190 ft. high in the face of an adverse wind. This must be pronounced a very satisfactory result, and the pump should be particularly useful as a stationary fire-engine in lofty buildings.

Messrs. W. H. Bailey & Co., of Salford, show a number of their double-acting fly-wheel steam pumps adapted for various duties. In these pumps ordinary flat slide-valves similar to those used in high-pressure steam engines are employed. The use of these valves for pumping purposes has extended considerably of late, and much can be said in their favour. The pump valve chambers are fitted with doors for adjustment or repair of working parts. The valves are considerably larger than is usual in pumps of similar construction, and are well adapted for lifting large quantities of water to a low head, such as is required in ballast or some contractors' purposes. The pump valves are made of india-rubber or gun-metal, as the condition of usage may require.

Mr. John Wolstenholme, of Radcliffe, shows a strongly-designed duplex rotary steam pump with bed-plate, front covers, and pedestals in one casting. Common flat slide-valves are employed, and the pump being double-acting on both suction and delivery is suitable for rough usage, as the concussion often found is here greatly modified, all parts in contact with the water being enclosed. The motion work is of steel.

Messrs. Hulme & Lund, Manchester, exhibit samples of their patent direct-acting steam pumps, for which they claim that there are only three moving parts for the distribution of the steam, viz., one small flat slide-valve in the top valve-box, and one main flat slide-valve, which is worked by one auxiliary piston. Both main and auxiliary pistons are steam-cushioned. The chief novelty in this pump is the method of moving the main flat slide-valve. This is done by a small auxiliary cylinder placed above the main steam cylinder, and a small flat slide-valve is attached to the top valve-rod, on which rod are adjustable collars; these are moved at the end of each stroke by the crosshead-arm on the pump-rod. The collars on the middle rod,—which is a continuation of the piston-rod of the auxiliary cylinder,—are set further apart than the others, so that the crosshead-arm only comes in contact with them when the steam from any cause fails to move the auxiliary piston quick enough; in such case the crosshead-arm, by contact with these collars, assists the steam to move the main slide-valve. Although the parts are somewhat increased by this arrangement, there is little doubt it makes the pump more certain in its action, and the outlay of steam for working the small auxiliary piston should be small.

Mr. John Cameron, of Manchester, shows samples of his well-known single and double acting vertical ram-pumps. The general design and construction of these pumps well maintain their reputation.

A stationary steam fire-engine is shown by Mr. Charles Walmsley, of Bury. It consists briefly of a three-throw pump, with air-vessel and receiver driven by steam cylinder and slide-valve of the ordinary type; this latter is worked by an eccentric. The plungers, buckets, foot-valves, and glands are made of gun-metal and the pump barrel is gun-metal lined. A treble-throw pump, with 12-in. cylinder, 10-in. pump, and 7-in. plunger, is stated to be capable of throwing 60,000 gallons of water per hour 100 ft. high, in jets ¾ in. diameter. In large establishments this pump should be useful.

Several engines and pumps are exhibited by Messrs. Tangyes (Limited), Birmingham, including a vertical engine and dynamo, a 12 in. by 24 in. horizontal engine fitted with Jefferis's patent automatic expansion gear, a centrifugal pumping engine, colonial ram-pump, and a selection of their direct-acting steam-pumps.

Mr. W. Gunther, of Oldham, shows a selection of Girard turbines, including one of 102-h.p. for a fall of 200 ft. This is coupled to a 40-light dynamo. Exhaust and blowing fans are also exhibited, and several centrifugal pumps.

Mansfield's apparatus for manufacturing oil gas is shown in the grounds by Messrs. E. Mansfield & Co., Manchester. The apparatus consists of a simple form of retort and gas-holder, and is designed to produce gas from any kind of oil or grease. A special sort of oil is usually used; this is non-explosive, and will not

give off inflammable vapour under a temperature of 212° Fahr. In comparison with the Salford town gas, the light of this oil gas is much more brilliant, and, tested by Wright's photometer, the result has been given as four to one in favour of the oil gas. This is a highly satisfactory result, to say the least, and in districts where coal gas is unattainable this gas should be of good service.

The Dowson Economic Gas and Power Company, Limited, Westminster, exhibit in the grounds their apparatus for producing fuel-gas, suitable for driving gas-engines, heating ovens, type-founding, soldering, &c. The apparatus is fitted with a governing arrangement, by means of which the production of gas is regulated automatically to suit a varying rate of consumption. The gas made is used in driving an engine. The process of making is very simple. It consists briefly in passing a jet of superheated steam, mixed with air, through red-hot anthracite, or small gas coke, contained in a generator. There is no exterior fire, and to make 1,000 cubic feet of gas, it is stated that only 15 lb. of anthracite and about seven pints of water are required, and, with fuel costing 10s. a ton, at a cost of about 2½d. per 1,000 cubic feet.

A patent cylinder filter, for the treatment of large quantities of liquids, especially water, is shown in the grounds by Messrs. Mather & Platt, of Manchester. Each filter consists of two vertical perforated metal tubes, one placed within the other, the space between them being filled with sawdust, charcoal, or other filtering material. The liquid to be filtered has to enter through the perforations in the outer cylinder or tube, and, after passing through the filtering material, is collected in the inner tube, whence it is conveyed in the service-pipes. The makers claim that it will remove from water all solid, greasy, or slimy matter, and that it is also applicable to the treatment of sewage.

Messrs. Howard, of Bedford, have a specimen of their patent portable railway, 24 in. gauge and 14 lb. rails; also an iron tipping wagon and samples of sleepers for portable and permanent railways.

Portable railway wagons and accessories are also exhibited by Messrs. Decauville, of Idol-lane, London. The rails used are of steel of very light section, and permanently riveted to cross sleepers. The rails are jointed in a simple way. The rail to the right hand is furnished with two fish-plates; that to the left with a small steel plate riveted underneath the rail and projecting beyond it. The lengths of rail are laid end to end, making the rail, which is fitted with the small plate, come in between the two fish-plates when the joint is made. The wagons are made chiefly of steel, and as the whole can be readily laid without skilled labour this system should be particularly useful for quarries, brick-fields, or contractors' purposes.

A self-acting cold-iron and steel circular sawing-machine is shown by Messrs. Lee & Hunt, of Nottingham. The girder or iron to be sawn is placed on a table and held by a powerful cramp, the saw is traversed past by a screw feed and is fitted with a quick return motion. The rate of traverse can be varied according to the material being cut. This machine should prove itself very useful to contractors of wrought-iron work, where many pieces have often to be reduced to one exact length.

A band-sawing machine for cutting iron is to be seen at the stand of Messrs. B. & S. Massey, Steam Hammer Works, Manchester.

The Blackman Air-Propeller Ventilating Company, Limited, 57, Fore-street, London, show a selection of their propellers.

Windmills are represented by the Ontario Pump Company, of Toronto, who exhibit one of their 10-ft. Halliday windmills working a vertical pump; a deep-well pump, a general purpose pump, and force-pumps are also shown. These, in conjunction with a windmill, should be very useful for irrigating and similar purposes.

A simple form of water-meter is shown by Mr. T. Kennedy, Kilmarnock. The measuring parts of this meter consist of a cylinder and piston,—the former of cast-iron and the latter of vulcanite,—on which an india-rubber roller forms an elastic separation between the top and bottom of the cylinder. A four-way cock directs the water alternately above and below the piston. This is actuated by a weight. All the moving parts move round on an axial line; friction and consequent wear are therefore considerably reduced. It is stated that this meter registers the smallest leak or ball-cock sure. For instance, the effect on pressure or the same as adding 3½ yards horizontally to the length of pipe, and it is also claimed that this meter cannot register against the consumer, while the facts that it works with a small flow, and that the index does not hang at the reverse, are conclusive that it is accurate.

A centrifugal pulveriser (Lucop's), and Mumford & Moodie's patent separator, are shown by Messrs. Askham Bros. & Wilson, Limited, Sheffield. The separator consists, briefly, of a tapering wrought-iron chamber with spout at the bottom; this chamber is divided, and also has an inner casing. A fan-blower is placed in the upper chamber, and as the ground material, —which is fed in from the top,—descends, a current of air circulates through it, the fine dust is thrown into the outer casing, and descends through the spouts into bags or casks. The coarse material falls down the inner casing, and passes out through a branch pipe to be returned to the pulveriser for regrinding. This apparatus is of simple construction, and will produce finished material of any degree of fineness. It should prove useful.

The Grinding and Polishing Machine Co., Birmingham, exhibit a grindstone with attachments which possess some fresh features. The stone is mounted in a trough in the usual way, but parallel guides are fitted to the trough, and the work is passed along these guides and over the top surface of the stone: consequently a true face is produced and the surface of the stone also remains true. Flat, bevel, convex, or concave surfaces may be produced, and by the use of guides prepared for a required curve work may be ground to any radius. An adjusting table and parallel vice for gripping rounds, squares, and tapers is fitted, and altogether this must be pronounced an extremely useful machine.

Messrs. Clark, Bunnett, & Co., Limited, London, show one of their hand rope safety lifts, and a sample of Clark's patent self-gripping crab. In this crab the ordinary winding drum is done away with, the lifting chain being arranged to pass in and out between small rollers shaped to suit the links of the chain and to grip it as it passes. The crab is worked with a handle in the usual way, and thrown in and out of gear by a clutch. A strap break is fitted, and the whole space occupied is much less than with crabs of ordinary construction.

We must not omit to notice the 173-h.p. patent water-tube boiler erected in the grounds by the Babcock & Wilcox Company, of Glasgow and New York. This type of boiler has met with considerable success of late, and there is little doubt it possesses advantages in making steam economically, combined with comparative safety in use. The boiler is made of lap-welded wrought-iron tubes placed in an inclined position and connected with each other, and with a horizontal steam and water drum, by vertical passages at each end. A mud-drum connects the tube at the rear and lowest point of the boiler. The end connexions are in one piece for each vertical row of tubes; and the tubes are "staggered." Openings for cleaning are provided opposite the end of each tube. The steam and water drums are made of steel or wrought iron, and the mud-drums are of cast iron, to better withstand corrosion or "pitting." The chief points claimed for this boiler are that, owing to the thinness of the heating surface-plates, heat is very rapidly transmitted from the fire to the water, consequently steam is rapidly and economically raised, and, owing to its construction, it is readily cleaned or repaired, and there is much less chance of an explosion than with boilers of the ordinary type.

A good display of steam traps and various engineering fittings is made by Mr. John Boyle, 27, King-street West, Manchester. Amongst these we noticed a steam trap for discharging air and condensed water from steam apparatus especially adapted for dirty situations or where there is dirt in the water. In this trap a ball-float in combination with a siphon is used. The cover is held on the trap by wing-bolts, to retain a slight pressure of steam within the box, sufficient to eject the water by the siphon, so long as steam comes to the inlet. If water accumulates behind the inlet the ejectment action ceases temporarily; the water thus accumulates in the cistern, raises the ball, and rapidly discharges the water until the pipes are again dry, when the ejectment action by the siphon lowers the ball and nearly closes the inlet. The outlet is open to the atmosphere to secure a free discharge. A patent return steam trap and hot-water (212° Fahr.) boiler feeder, patent reducing valves, hydraulic test-pump, improved swivel unions and bends, &c., are also exhibited.

A self-acting gas governor is exhibited by Messrs. Jas. Stott & Co., 10, Market-place, Manchester, and although there is justly a prejudice against gas regulators, owing to many failures, the one under notice has several fresh features about it.

What appears to be a distinct improvement in fusible plugs for steam boilers is shown by the English and Scottish Boiler Insurance Co., Limited, of 58, Fountain-street, Manchester. The improvement consists in the introduction of a packing pad of asbestos between the steam and the fusible metal, in such a way that when the metal becomes melted it drops into the furnace, and the pressure in the boiler forces out a lead washer and the asbestos wad, leaving a clear opening for the steam to escape. By this arrangement, direct contact of the steam or water with the fusible metal is prevented, thus obviating partial fusion, as it is generally concluded that a flow of steam coming in contact with partially-fused metal stops further fusion. The use of the asbestos wad prevents also the cooling effect of the steam on the fusible metal, it then facilitates the melting. The fusible metal and asbestos wad are readily renewable.

Pulleys, &c.—A large number of the pulleys used in the Exhibition are wrought iron or steel split ones, made by Messrs. Perkins, Son, & Barrett, of Bradford. They appeared to run very true, and we were informed that all pulleys made by this firm are carefully balanced and turned in a lathe.

The Power Pulley Company, of Manchester, show some of Shepherd's patent perforated pulleys. These contain a large number of perforations through the face of the pulley, the object being to prevent driving-belts slipping by rapidly discharging the air found between the belt and the pulley through the perforations.

With the same object, *i.e.*, to prevent belt slipping, Messrs. Wilkinson & Co., Manchester, exhibit samples of perforated covering for pulleys.

As was to be anticipated, there are a great number of exhibits connected with steam and the steam engine, such as pistons, steam traps, boiler-fittings, economisers, &c. Some of these are well worthy of notice had the limits of our space permitted.

Altogether Manchester must be congratulated on its exhibition, as it possesses features of interest in certain departments that have rarely if ever been surpassed.

ARCHITECTURAL ASSOCIATION SUMMER VISITS.

THE second summer visit of the Architectural Association was made on the 11th of June to a house at Banstead, Surrey, erected for the Hon. F. Baring, from the designs of Mr. Norman Shaw, R.A. The ground-floor story walls are of thin red brick, with Ham Hill stone dressings. The upper part of the house is of half-timber work, with some portions tile hung, the rain-water pipes having very elaborate lead heads. The entrance-hall and staircase are panelled with oak of a very light colour; the drawing-room is panelled with painted woodwork, which still has to be decorated.

The third visit was made on Saturday, the 18th inst., to Cambridge, under the guidance of Mr. W. M. Fawcett, M.A. The first College visited was Christ's, where the entrance gateway and the oriel over the entrance to the Master's Lodge are the only portions of the sixteenth-century work left, the clunch stone used having become so decayed that the walls were cased in the eighteenth century, and the windows inserted in the Classic taste. The Round Church was next visited, and thence the party proceeded to St. John's College, the Divinity School, by Mr. Basil Champneys, being noticed in passing. Professor Mayor conducted the party over St. John's College, which was founded by Margaret, the mother of

Henry VII., the entrance gateway, like that of Christ's, which was also founded by Margaret, having the Tudor rose and portcullis and "Marguerites" carved over the archway. The Hall was lengthened in 1863 by the addition of a large bay, and the Chapel was pulled down to make way for the sumptuous building from the design of Sir Gilbert Scott. The three arches forming the entrance to Fisher's Chapel have been built into the south wall of the ante-chapel. The Combination-Room has a handsome plaster ceiling, and beyond this is the Library,—a new set of rooms now being built from the designs of Mr. Penrose, and connected with the old buildings at this point. Passing over the bridge, the "New Courts" built in 1826 from designs by Mr. Rickman were inspected.

Trinity College was next visited. The entrance-gate, which dates from 1535, was until recently covered with plaster, but this has been removed, and the original bricks and stone exposed, the latter is very much marked with holes to give a key to the plaster but otherwise is not much damaged.

The next College visited was Caius, and then King's, where the Chapel, with its magnificent fan vault, was examined, and the screen of Flemish woodwork was compared with the Jacobean stalls. The party went on the roof and examined the upper side of the vaulting, and then passed into the Hall. From this college they passed to Clare College, and subsequently to Queen's, after passing down "The Backs" and by the mill-pond. This college, founded by two queens, is an interesting example of the form of the early colleges; Prof. Willis, when he measured it, found that it corresponded closely to the plan of Haddon Hall. Additional buildings are being erected from the designs of Mr. W. M. Fawcett. St. Catherine's and Corpus were next visited. In the latter, the old hall is now used as the kitchen. The new buildings were designed by Mr. Wilkins. The Church of St. Benet, which adjoins the College, was formerly used as the college chapel, and is connected with it by means of a gallery (now used as a vestry by the church). Pembroke college was then visited; the Chapel, designed by Wren, and the ceiling of the Combination-Room, being regarded with special interest. The new buildings are from the designs of Mr. Waterhouse and Mr. Gilbert Scott. Peterhouse was the last college visited. The Church of St. Mary-the-Less was used by the College, and connected with it by a corridor (also now used as a vestry).

THE SANITARY INSTITUTE.

SIR,—As a member of the Referee Committee of Council of the Sanitary Institute of Great Britain, it is my duty to make arrangements for the reception of papers to be read at the forthcoming Sanitary Congress at Bolton in September next.

Will you be so good as to allow me to call the attention of the profession to this yearly opportunity of recording the advances made in the practical application of the principles of sanitary science to civil architecture?

EDWARD C. ROBINS.

THE PRESERVATION OF STONE.

SIR,—With reference to your recent articles on the above subject, I trust you will permit me to point out that syenite and syenitic granite are not synonymous terms for the same rock, and that syenitic granite *does* contain mica as an essential constituent, with hornblende, quartz, and felspar. Syenite is not a variety of granite, but a distinct rock. In the trade, I know, several different kinds of stones are embraced under the term "granite" (some of them being limestones), but it is impossible for science to assist in the selection of these rocks for building purposes unless each kind is separately dealt with.

I quite agree with your remarks on lichens, &c. (p. 860). GEO. F. HARRIS, F.G.S.

SIR,—In your article on the above in your issue of the 11th inst., you state, "It has, at various times, been more or less authoritatively stated that lichens which form frequently on stone surfaces in country places help to preserve such stone, but this idea is not supported by any reasonable argument."

In this district (Isle of Portland), where lichens, &c., are abundant, it is always maintained that whilst the lichen may not preserve the stone, the very fact of its being on the face, proves the stone to be a good weathering piece, as, were it otherwise, and constantly crumbling away, the lichens could not take root and thrive, as every rub or shower of rain removes the disintegrated parts. There is a wall near me, built of brown (exterior or weather) Portland stone, and a few pieces of white (or interior) Portland, the former, being covered with a greyish lichen, exhibiting every tool-mark, although centuries old, whereas the latter is constantly, but almost imperceivably, wasting, and has a yellow, decomposed appearance, without any lichen on it.

F. J. BARNES.

THE CONGRESS OF FRENCH ARCHITECTS.

MONSIEUR,—J'ai lu avec grand intérêt le Compte-rendu du Congrès des Architectes Français publié dans *The Builder* du 18 juin, mais permettez-moi d'attirer votre attention sur trois points, non à l'état de rectifications, mais seulement comme complément d'informations:—

1. *Caisse de Défense mutuelle des Architectes.*—Comme tous les ans, le compte-rendu de la séance annuelle de cette Association a été analysé devant le Congrès, qui à constaté, avec l'accroissement des membres de la Caisse, l'importance et l'intérêt des affaires dans lesquelles la Caisse de Défense est venue en aide aux associés.

2. *Propriété Artistique.*—MM. Ach. Hermant, Ch. Lucas, et Alf. Normand, membres du Conseil de la Société Centrale et H. and C.M.R.I.B.A., ont soumis à la dernière séance de Congrès un vœu pour que le Gouvernement Français ratifié la Convention signée à Berne le 9 Septembre, 1886, en vue de la création d'une Union Internationale pour la Protection des Œuvres littéraires et artistiques (les dessins d'architecture étant compris dans ces dernières).

3. *Droits des Architectes des Administrations publiques.*—La Commission qui a étudié cette dernière question a soumis au Congrés, qui l'a adopté à l'unanimité, une suite de vœux en réponse à la lettre de M. le Ministre des Beaux-Arts, vœux dont le plus important est ainsi libellé: "Qu'il ne peut être accordé à un Ministre ou à tout autre fonctionnaire ayant appelé un architecte à un emploi public, de conserver à l'endroit de cet architecte le droit absolu de révocation; mais que ce droit doit être entouré, pour l'architecte, comme pour le magistrat, l'officier, le professeur, ou tout autre fonctionnaire de l'Etat, de garanties équitables dont les principales pourraient être une enquête, la nécessité de faire la preuve de la faute reprochée à l'architecte et l'examen de la cause par une Commission composée en partie d'architectes, devant laquelle l'architecte incriminé serait appelé à se defendre."

CHARLES LUCAS.

Paris, 19 Juin, 1887.

GUILDFORD SHIRE HALL RESTORATION.

SIR,—I wish to ask the question, whether town-halls built in the last quarter of the seventeenth century had, as a rule, open roofs or flat ceilings? My reason for asking is that the old Shire Hall in this town (date 1683), whose quaint façade and bell-turret are the most noticeable objects in the High-street, has been undergoing restoration, and one of the first steps taken by the architect was the removal of the flat ceiling in the hall, and the substitution of an open-timbered roof.

The plea for this alteration was that one of two tie-beams had its lower face chamfered, as if formerly exposed to view. On the other hand, there was the clearest evidence of the flat ceiling having been the original one in the state of the other timbers, which are rudely shaped, of unequal size, and destitute of ornament. In place of kingposts, there was an unsightly arrangement of struts rising obliquely from the centre of each tie-beam to the roof in the form of an inverted pyramid.

The question, of course, is not whether an open-timbered roof is the better architectural feature or not, but whether it is historically correct, and in its right place in a Late Jacobean hall.

And as this is a point for archæologists to decide, I hope to elicit an opinion in the pages of your journal.

H. S. T.

Guildford, June 19th, 1887.

Preservation of Archæological Remains in Prussia.—The Prussian Minister of the Interior has issued a circular to the civic and rural authorities in Prussia requesting that careful returns be made of all archæological remains existing within each commune. The circular also ordains that in future the vestry of every parish shall, on excavations or finds of graves being made within their boundary, superintend the same, and in case of discoveries being made of ancient remains, monuments, and archæological objects, report such, and see that no further excavations take place unless directed by a qualified archæologist. The sale of archæological objects thus discovered is also strictly forbidden.

The Student's Column.

FIELD WORK AND INSTRUMENTS.—XXVI.

Levelling Instruments.

XII.—HAND LEVELS.

THESE instruments are of great service in preliminary work, or for arriving at an approximate comparison of levels in places where a larger instrument would be warned off. They commend themselves chiefly on account of their portability, as they can be easily carried in the pocket when not in use. Fig. 1, which shows the longitudinal section of a reflecting level, illustrates the manner in which the detailed portions shown in fig. 2 are connected. B is an inner tube carrying half a convex lens, which magnifies a horizontal line marked across the reflecting-plate E. This plate or mirror occupies one-half of the interior of the tube to which it is attached underneath the centre of the spirit bubble K. The remaining half of the interior of the tube is left open to enable any distant point to be observed, the open and mirror portions being respectively placed upon opposite sides of a vertical diameter, as indicated in fig. 2. The object seen when the bubble is in the centre of its run is, therefore, on a level in the line of sight, A D, with the observer's eye at A. A stop-piece is introduced to aid distinct vision, and is attached to the centre of the outer tube, as shown in fig. 1. It will be noticed that as no magnifying power is employed to observe distant points, the distance at which the divisions upon a level staff can be distinctly read is very limited.

Fig. 7 illustrates a reflecting balance level hung upon gimbals. It is constructed upon the principle that a small mirror suspended vertically, when held at a short distance from an observer at the level of the eye, will reflect the pupil of his eye. As in the instrument previously described, a portion of the space is either open, or the glass is left plain, through which to view a distant object; and the eye of the surveyor is directed upon the line marked E across the silvered glass, so that when the reflection of half of the pupil of the eye is seen upon this line at the edge of the mirror, the observer is guided to read points at a distance in a horizontal plane upon a level with the eye. The height of the instrument from the ground, if required, is readily determined. In some instruments the mirror is fixed horizontally. In the illustration it is placed vertically. The instrument is held in the hand at arm's length by the ring H in fig. 7, and a level staff being held at any desired stations, such as F and G in fig. 6, first at one point, then at the other, with the instrument at the same level, the readings upon the staff can be compared in order to determine the rise or fall in the ground.

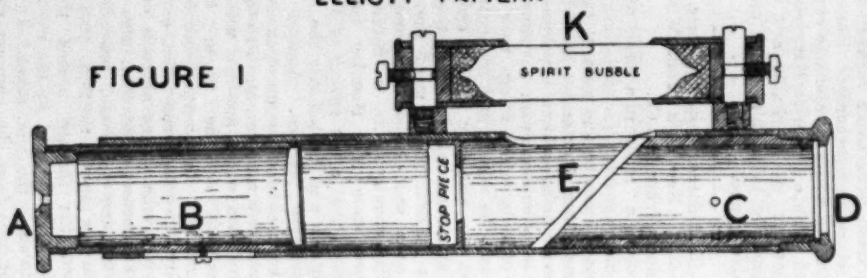
In Captain Abney's level illustrated by figs. 3 and 4 we have a reflecting level and clinometer combined. It consists of a spirit level so fixed at K to a limb carrying a vernier that by turning a milled-edged wheel at the side of the telescopic tube as shown in plan in fig. 4, the vernier arm is made to move at right angles to the run of the bubble and upon the same transverse axis. The arc traversed by the vernier is graduated to indicate certain angles of inclination together with the corresponding ratio to the horizontal of the rise or fall of the gradient. The sight tube is divided horizontally in its interior by a glass half silvered fixed immediately below the bubble tube, in a similar manner to the detail shown in figs. 1 and 2, but the open portion in fig. 1 is in this instrument filled in with plain glass so that the central horizontal line is marked across both the silvered and unsilvered portion of the glass.

To test the accuracy of the instrument select two distant points which shall previously be determined upon the same level. Set the arrow-head upon the vernier arm to the point indicating zero upon the graduated arc, as shown at E in fig. 3, and look through the sight tube at the two points under observation. The bubble should then stand in the centre of its run, and be half reflected exactly upon the dividing line of the silvered portion of the glass. To arrive at the inclination or vertical angle of any given slope the telescopic tube is held upon or placed parallel to the slope, as shown in fig. 5, and the side milled edged wheel is then turned by the hand until the bubble appears in the centre of its run. The reading upon the arc at N will give the

HAND LEVEL

ELLIOTT PATTERN

FIGURE 1



NOTE IT WILL BE OBSERVED THAT THERE IS NO MAGNIFYING POWER EMPLOYED TO READ THE STAFF IN THESE REFLECTING INSTRUMENTS, AND THEREFORE THE DISTANCE AT WHICH THE STAFF CAN BE DISTINCTLY READ IS VERY LIMITED.

FIGURE 2

THE HALF LENS MARKED B. IS A PLANO-CONVEX LENS, FOR MAGNIFYING THE REFLECTION OF THE BUBBLE K. IN THE MIRROR AT E.

FIGURE 6

NOTE THE INSTRUMENT IS HELD BY THE RING H. IN SUCH A POSITION THAT THE SURVEYOR'S EYE IS REFLECTED IN THE MIRROR-PORTION E - IN FIGURE 7 AND THEN THE LEVEL STAFF IS READ AT ANY REQUIRED STATIONS F. AND C. IN ORDER TO ASCERTAIN THE FALL IN THE GROUND.

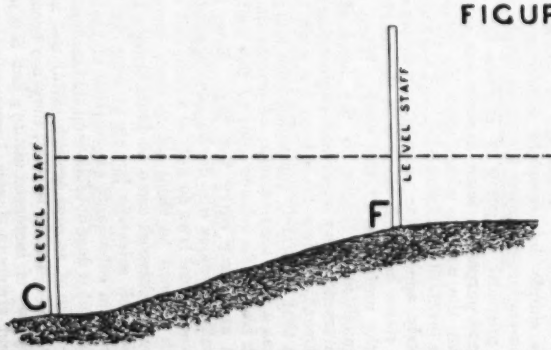


FIGURE 6

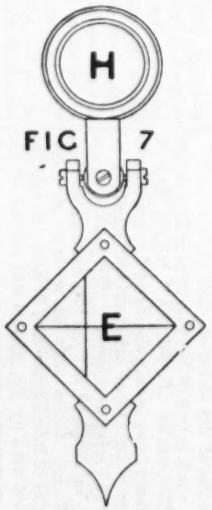
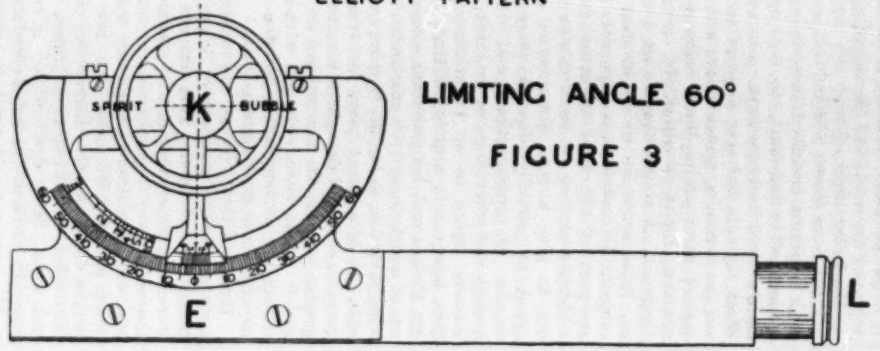


FIG 7

—REFLECTING LEVEL SUSPENDED ON CIMBALS—

ABNEY'S LEVEL

ELLIOTT PATTERN



LIMITING ANGLE 60°

FIGURE 3

FIGURE 4

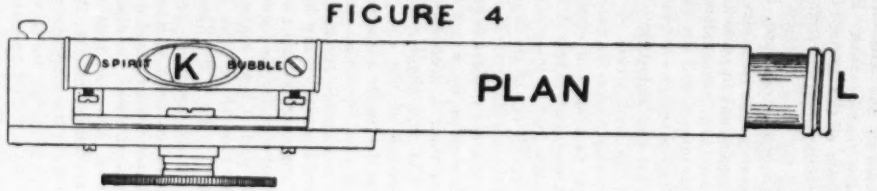
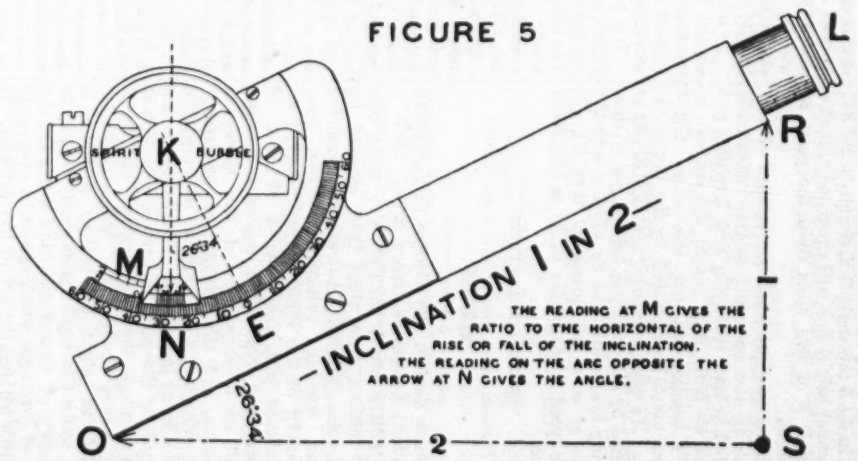


FIGURE 5



—CAPTAIN ABNEY'S LEVEL GIVING INCLINES—

angle of the gradient. It will be seen that the angle R O S is equal to the angle E K N, and that if in fig. 5 the angle E K N equals 26° 34′, the vertical height R S will equal one unit at a distance O S of two units from the point of observation.

We have now provided our readers with an account of the principal optical instruments employed in land surveying and levelling, and such as we trust may enable the student to properly handle and use the same. Great patience must be exercised by the young beginner. He must remember that it is better to be blamed by his employer for being slow, than for being inaccurate, and he will find with the exercise of care and precision, that he will acquire speed in proportion as he is diligent in practice.

Books.

The Steam Engine. By George C. V. Holmes. London: Longmans, Green, & Co. 1887.

THERE could hardly be a more ambitious title than that selected by Mr. Holmes. As we are reminded in the opening paragraph, "the complete study of the steam-engine involves an acquaintance with the sciences of heat, of chemistry, and of pure and applied mechanics, as well as a knowledge of the theory of mechanism, and the strength of materials," thus opening up an acquirement of knowledge Baconian in its immensity. The author is undismayed by the task he has set himself, and ranges through the five hundred odd small octavo pages from the "hollow cylinder of indefinite height, the bottom of which is closed while the top remains open," &c., up to the theory of strains on crank shafts and the action of governors, which cannot be adequately dealt with without the aid of the calculus. It is well to say at once, however, that whatever has been attempted has been well done, and the book proves the author to possess a mastery of the subject and a gift of lucid explanation, which must give it a high position amongst text-books of the steam-engine.

The work is one of that most excellent series of "Text-books of Science" which Messrs. Longmans have been publishing for some years past for "the use of artisans and students in public and science schools." We think artisans might be dropped out of the announcement; for, though there may be a few of those paragons of intelligence and industry in humble life (met with by Mr. Smiles and writers of his class) who might profit by such a work as that under review, their number must be so few as to make it unnecessary to appeal to them as a class. If for "artisan" we were, in the present instance, to substitute "practical designers of engines," the case would not be a great deal more hopeful. It is not a generally acknowledged fact, but fact it is none the less, that ninety-nine out of every hundred engines designed are plotted out by "the grand old rule of thumb." Years ago we had a vision of a simple but complete text-book on the steam-engine, compiled for those employed in the practical designing of engines for commercial purposes. Such a work was to have shown the way in which scientific principles were involved in construction, and were unconsciously applied (or misapplied) in practice. The vision has fled, along with the conviction of the usefulness of the work. When once a draughtsman attains to the head of his department in any important engineering establishment, he has little time for work other than that absolutely demanded from him; and he has a vast accumulation of proved data to work from. So science goes to the wall, and trial and error carry the day. Even those ingenious persons who devise new applications of mechanical laws do not, as a rule, call overmuch science to their aid in their inventive labours; although some of them bring a heavy battery of scientific jargon to bear on their hearers in subsequent explanation of their devices. But it does not follow on this account that text-books of science are not useful and necessary. As a matter of fact, they are becoming every day of increased utility; but it is to the second string to Messrs. Longman's bow,—the student,—that they must appeal. Rule-of-thumb designing is like learning to play the piano by ear: it precludes the hope of a more scientific method. Therefore, we must catch our designer young, and train him early to virtuous habits. Fortunately the possibilities to this end are increasing year by year. It is to the technical students of the present day that we must turn for the hope that this country will be able to battle for that engineering supremacy which, although threatened, has happily not yet been wrested from its grasp.

To return to Mr. Holmes's book in particular, we find it opening, as we have intimated, with the first elements of the subject, and the clear manner with which the subject-matter is treated must render it plain to the most uninstructed.

The next section of the book treats of the nature of heat, and gives the reason for accepting the theory that heat is a form of energy. The subject is one that may, and, in less skilful hands, undoubtedly would, lead to the student reader being led considerably out of his depth; but here, again, Mr. Holmes's talent for simple exposition stands him and his readers in good stead, so that the phenomena by which the conversion of heat into work is accompanied are clearly set forth. The next chapter is no doubt the natural outcome of the one just referred to, but it carries the reader a long step, and is indeed a sort of *pons asinorum*, which will not be altogether a pleasant surprise for the student. There are, however, many hard nuts for the sucking engineer to crack; and, undoubtedly, he had better consider the requirements of "theoretically perfect heat engines," whilst the knowledge gleaned in the last chapter is still in his mind. But if Mr. Holmes shows, on this occasion, not overmuch mercy to his inexperienced readers, he is at least a safe guide, and those who do master the chapter will find they have acquired sound knowledge. It must not be supposed, however, that this chapter has only an academic interest. The descriptions given, especially the graphic representations of the various problems, are of very real and practical interest, and must necessarily be understood by those who would soar above rule-of-thumb designers. The laws connecting the pressure, volume, and temperature of dry steam, as laid down by the best authorities, are set forth, and the reasons why a practical working steam-engine falls so far short of the theoretically perfect engine are explained. The subject is further pursued in the next chapter, and here the necessity for higher mathematics arises in considering the applications of principles laid down by various authorities. In the succeeding chapter the student is introduced to a fresh branch of the subject in "the mechanics of the steam engine." Here, again, the author begins with those elementary principles which underlie the problems involved, taking nothing for granted, but working upwards from sure foundations of fact. The consideration of the twisting moments on crank shafts is a good example of this; the relation between these results and their source in the varying pressure of steam on the piston is well illustrated by means of the indicator. The influence of inertia of reciprocating parts is another part of this chapter well worthy of attention. It is a subject which in times past has been too much neglected in practical work, but is happily receiving more attention in the present day of high piston speeds, to which the best designed modern engines owe much of their success. In Chapter VI. the student finds himself amongst simpler details of general practice relating to various parts of the mechanism. The consideration of strains on crank shafts and the action of governors naturally require mathematical treatment of a comparatively complex nature, but there is nothing that the ordinary student will find above his powers.

The treatment of valves and valve gears occupies a large section of the book. There are simple illustrations showing the manner in which steam distribution is effected with an ordinary slide valve, and the reader, having mastered this elementary knowledge, is introduced to some of the less common arrangements met with in practical work. The theoretical aspect of the case is mainly taken up, as of necessity almost it must be, by an examination of Zeuner's well-known diagrams. We can cordially recommend to the attention of all students this part of the book, especially those who have not the time to go through Dr. Zeuner's original work.

The next chapter is hardly so satisfactory. Probably Mr. Holmes says all that he well can in the space at his command about the steam-engine indicator, but the subject is far too large to be treated of within the limits of a single chapter. We think it would have improved the work had the succeeding chapter on the boiler been omitted, and much that is left out have been inserted respecting indicator diagrams and the lessons they teach. We are inclined to find fault, too, with the lack of more modern instances in this part of the book. What there is, however, appears to be sound, and the governing principles are well explained, besides some useful hints being given as to common faults revealed by some typical diagrams. A single chapter on boilers is far too little space in which to deal with the subject. Of course it is impossible to treat of one part of the most important heat engine without including to some extent the other, but to give a few illustrations of various types, to partially discuss proportions and details of construction, and to describe fittings and mountings, is, we think, expending valuable space in an unsatisfactory matter. This, however, is a question that lies between Mr. Holmes and his publisher,—as the book is one of a series,—and we are bound to add that what is said is, so far as it goes, unexceptionable. It is a great pity, however, that the question of forced draught is not dealt with at greater length. It is a subject on which the author might have enlarged with advantage, considering its importance and the scarcity of information in existing text-books.

There is a short chapter on condensers, which leads up to the question of condensation of steam in cylinders. This subject naturally introduces super-heating and steam-jacketing, the reasons why the former has been abandoned, and why the latter is too often unsuccessful, being stated. We next find the compound engine discussed, the distribution of steam, as illustrated by indicator diagrams, theoretical and actual, being dealt with. A considerable appendix and a useful index conclude the book.

We have not said much in criticism of this work. Indeed, there is very little to criticise, for Mr. Holmes has not attempted to advance any new theories or introduce fresh discoveries. His duty as the compiler of a text-book has been observed throughout. He has selected the best authorities on the various subjects and plainly set forth their views, combining them with those recognised facts for which there is no authority. There may be a few points in which the opinions expressed will jar with some engineering theorists of repute. This, however, was inevitable, and Mr. Holmes has generally taken his stand on the least assailable ground.

Warm-Blast Steam Boiler Furnace. By J. C. HOADLEY. New York: John Wiley & Sons. London: Trübner & Co.

THIS book is a "report of a series of trials of a warm-blast apparatus for transferring a part of the heat of escaping flue gases to the furnace." It seems rather an extensive business to devote a by no means inconsiderable volume to a record of one set of experiments; but Americans have a way of doing these things very thoroughly. The task the author had to accomplish was to test the efficiency of an economiser or heat-extractor which was then devised, and is constructed on much the same principle as a well-known economiser in use in this country. As a result we may at once state Mr. Hoadley came to the conclusion that a net saving of 10 to 18 per cent. of fuel was effected over the best attainable ordinary practice. Against this there must be considered the question how soon the apparatus will wear out, and also the increased rapidity with which fire-bars will deteriorate on account of the warm blast. The "abstractors" in question consist of 2-in. ordinary lap-welded iron tubes, expanded into cast-iron tube plates at each end. These tubes are encased within 3-in. tubes of thin iron. The escaping gases and products of combustion pass through the 2-in. tubes, and the air to feed the furnace passes through the annular space formed by the insertion of the 2-in. tubes in the 3-in. tubes. As the extraction of heat from the chimney gases by this device would check the draught, a fan was provided.

We do not think our readers will expect us to follow Mr. Hoadley through the minutiæ of his trials and researches, which are so fully set forth in his book. Any experimentalist who may have to go through a similar course will undoubtedly find the work useful, although we

think that even to those most closely identified with such matters, some of the results will seem to be worked out with a minuteness little short of pedantry. To take an instance at random, on p. 49 we find an "Account of the experiment to determine by the third method the heat capacity of the calorimeter." Here we have the steam pressure given with three places of decimals (66·094 lb.), and on this the number of British thermal units in a pound of steam is further calculated to four places of decimals. Of course the British thermal unit is a small unit, and it is necessary to calculate closely, but this over-refinement in the manipulation of figures is useless, unless the data obtained are equally beyond question. Mr. Hoadley, however, only follows the practice of his compatriots.

Mensuration Made Easy; or, the Decimal System for the Million. By CHARLES HOME. Seventeenth Edition. London: Effingham Wilson & Co.

A VERY useful practical little book, giving plain explanations of the working of decimal arithmetic, with a number of "applications to the daily employments of the artisan and mechanic." That it has been found practically useful by those for whom it is intended seems to be indicated by the number of editions it has gone through.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

7,541, Transparent Material for Roofing. MM. Brophy and J. A. Archer.

This invention relates to improved machinery for manufacturing roofing material composed of wire gauze, covered or coated with some transparent mucilage or substance, and the machinery described in this specification is designed to effect great economy in its manufacture.

8,876, Fastenings for Doors and Windows. H. W. Hennes.

The improvements which are the subject of this invention are designed to obviate several disadvantages in the form of fastenings of double doors or windows, in which the act of closing the second door automatically fastens the first, which has been already closed, and to cheapen the cost of manufacture. A frame is made, in which works a lever so placed that one of its ends, which is bevelled on both sides, protrudes; the other end is withdrawn into the plate. The bevelled projection is so arranged that it is under the edge of the door which is first closed. Near, or on this edge is a hole of suitable shape and size into which the bevelled projecting end rises, and holds the door when the door is closed. The second door is secured by a catch or lock, and so long as it remains closed, the first door is equally securely fastened.

8,889, Safety Fastenings for Sashes. W. Dryden.

The class of fastener which is the subject of this invention belongs to those for vertical sliding window-sashes, which, while affording security against burglars, allow also for the sashes to be lifted, say six inches or so for ventilation, and secured, whether so open or closed. The fastening is arranged by the use of a horizontal locking sliding bolt, controlled by a weight or spring retaining catch, and a vertical retaining stop slide case or plate. This is fixed at the side of the sash and frame, with a plate notched or perforated so as to retain the windows in different positions with respect to height.

12,565, Gully for Excluding Sewer Gas. R. Atkinson.

According to this invention a hinged metallic valve, with india-rubber face, working on an inclined plane, is fitted on the end of the gully inside of the trap-box. The action of the valve is such that as soon as a sufficient head of water enters the gully the valve is automatically opened. As the pressure of water is reduced the valve shuts, and no sewer gas can enter the gully from the sewer. The cover is made airtight.

5,204, Sanitary Appliances. G. Price.

The object of this invention is to arrange receivers, &c., and their connexions with the sewer or drain, in such manner that the soil after leaving the receiver shall not come in contact with the sides or surface of the connexions, but shall have a clear fall direct into the water at the bottom of the trap. A vertical pipe is provided, and a sharp edge is formed around the outlet of the basin or receiver. The aforesaid pipe being vertical and parallel sided, it forms a full continuation from the receiver, and allows the soil to fall clear into the water without contact with the sides.

NEW APPLICATIONS FOR PATENTS.

June 10.—8,341, W. Griffiths, Door and Window Fittings. — 8,361, H. Belcher, Brick Pressing Machine.—8,375, R. Stanley, Tunnelling Machines.

June 11.—8,406, F. Binney, Closet Seat Cover.—8,439, C. Doehring, Street Paving, &c.—8,450, R. Low, Dovetailing Machines.

June 13.—8,473, G. Newman, Combined Door-spring and Check.—8,489, W. Milton, Fireproof Metallic Plastering.—8,497, C. Hax, Machines for Sharpening Saws, &c.

June 14.—8,509, G. Evans and C. Ford, Wood Block Floors.—8,559, H. Lake, Apparatus for Opening and Closing Windows.—8,563, W. Bradley and Others, Floor Cramp, &c.

June 15.—8,585, H. Johnson and T. Wilson, Exhaust Valve Ventilators.—8,586, H. Johnson and T. Wilson, Exhaust Ventilating Cowls.—8,648, A. Rammage, Fireproof Column and Stanchion combined for Building Construction.

June 16.—8660, E. Verity and Others, Attaching Combined Springs and Air Checks to Doors, &c.—8,678, A. Caldow and J. Burnett, Heat Diffusers and Ventilators for Buildings, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

6,265, T. Robson, Falling-in Sliding Window Sashes.—6,649, W. Anderson, Ventilating Sashes.—6,820, W. Gwinett, Eaves Plate for Corrugated Roof and Wall Coverings.—6,990, L. Sunter, Water-closets.—7,113, J. Horne and S. Hollyman, Warming and Ventilating Houses, &c.—7,217, J. Clarkson and S. Wilkinson, Water-closets.—7,448, J. De Winton, Machinery for Sawing Slate and other Stone.—4,458, W. Barker, Die for Brickmaking Machines.—7,411, A. Busch, Manufacture of Cement.—7,767, A. Clark, Window Sash Fastener.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

10,384, G. Nobes, Door Lock.—4,917, W. Hawkins and W. Fisher, Axle Pulleys for Window Sashes.—6,648, J. and C. Levers, Draught, Dust, and Rain Excluder for Doors or Windows.—6,675, A. Boult, Hangers for Sliding Doors or Windows.—6,970, T. Kohler and W. Chambers, Kiln Dumping Floors.—10,453, R. Evered and N. Coleman, Flushing Cisterns.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

JUNE 7.

By Messrs. COBB.

Westhanger, Kent—Pound House, and 12a. 2r. 31p., freehold	£810
Two Enclosures of Arable Land, 16a. 3r. 17p., freehold	920

JUNE 9.

By FULLER, MOON, & FULLER, at Croydon.

Croydon, Epsom-road — The freehold houses Glenearn and Glenroy	1,700
51 to 54, Union-street, freehold	115
102 and 108, Canterbury-road, freehold	430
Waddon—8, Waddon Marsh-lane, freehold	160

JUNE 10.

By Messrs. COBB.

Sittingbourne, near—The freehold residence, Little Claxfield, and 1a. 2r. 27p., fruit land	560
Freehold orchard land, 2a. 0r. 32p.	380
Claxfield Farm, and 46a. 3r. 35p., freehold	3,500
An enclosure of arable land, 4a. 2r. 30p., freehold	320
An enclosure of arable land, 55a. 2r. 19p., freehold	3,500
Two freehold cottages	320

JUNE 13.

By F. STOCKER.

Ladywell—1 and 2, Vicar's Hill, freehold	500

By WEATHERALL & GREEN.

Kingston-on-Thames—11, 12, and 13, Letchmere-terrace, freehold	160

JUNE 14.

By T. G. LANGRIDGE.

St. John's Wood—85, High-street, 33 years, ground-rent 5*l.* 5s.	900
3, Ordnance-road, 47 years, ground-rent 8*l.*	475

By H. RUTLEY.

Barnsbury — 61, Copenhagen-street, 34 years, ground-rent 2*l.*	450
Homerton—18, Churchill-road, 78 years, ground-rent 4*l.*	205

By RICHARDSON & BARTON.

Primrose Hill-road — Improved ground-rent of 77*l.* 10s., term 77 years	1,660
Oppidans-road—An improved ground-rent of 10*l.*, term 77 years	215

By THURGOOD & MARTIN.

Gray's Inn-road—15, Ampton-street, 35 years, ground-rent 5*l.*	455
Westbourne Grove—Improved ground-rent of 12*l.*, term 33 years	180

By L. FARMER.

Kilburn—1, Priory Park-road, 78 years, ground-rent, 10*l.* 10s.	410

By DEBENHAM, TEWSON, & CO.

Burgess Hill, near — Burgess Hill Farm, and 81a. 2r. 15p., freehold	5,500
A pair of freehold cottages and garden	310
Blackbrook Farm, and 316a. 2r. 6p., freehold	4,850
Gallop's Farm, and 41a. 2r. 32p., copyhold	470
Inholm's Farm, and 12a. 3r. 4p., copyhold	320
An enclosure of land, 6a. 3r. 8p., freehold	300
Hayward's Heath, near—North Slugwash Farm, 243a. 0r. 34p., freehold and copyhold	2,500
Two enclosures of land, 5a. 1r. 39p., copyhold	270
Westmeston—Upper Burrell's Farm, and 10a. 3r. 37p., copyhold	900
Spooner's and Cook's Farms, The Bricklayers Arms, cottages, and 60a. 1r. 35p., freehold and copyhold	2,500
Copyhold cottage and garden, and a house, and 1a. 0r. 11p.	300
North Cottage, and 0a. 1r. 34p., freehold	75
Novington Lodge, and 446a. 1r. 12p., freehold	7,600
Stanton's and Chapel Farms, and 336a. 2r. 24p., freehold	7,300
Drew's Farm, and 43a. 2r. 26p., freehold and part copyhold	£800
Plumpton Cottage, and 1a. 1r. 29p., and another cottage	545
Freehold rent charge of 7*l.* 10s., subject to a payment of 4*l.* 6s. 8d.	60

JUNE 14.

By BEAN, BURNETT, & ELDRIDGE.

Contingent reversion to the freehold residence, Abbotsmead, Great Malvern, life aged 56 years, provided a life aged 28 survives, and a policy for 800*l.*	325

By RUSHWORTH & STEVENS.

Putney—34 and 36, Charlwood-road, 64 years, ground-rent 10*l.* 10s.	795
Kentish Town—10, and 13 to 18, Newberry Mews, 63 years, ground-rent 35*l.*	480
Shepherd's Bush — 71, Stowe-road, 91 years, ground-rent 7*l.* 7s.	140
South Acton—1, Keble-terrace, 94 years, ground-rent 6*l.* 10s.	190

By DRIVER & CO.

Shenley, Herts — Well End Lodge and Farm, 71a. 2r. 31p., freehold	5,000
Buckett's Land Farm, and 86a. 2r. 6p., freehold	5,500

JUNE 15.

By ROBINSON & RUDKIN.

Victoria Park — 16, Cadogan-terrace, 67 years, ground-rent 6*l.* 6s.	255

By WAGSTAFF & WARMAN.

Brixton—319, Coldharbour-lane, 35 years, ground-rent 3*l.* 12s.	565

By NEWBERRY & CO.

South Norwood, Howard-road—Wykenham House, 77 years, ground-rent 15*l.*	440
Crescent-road — The residence Parkhurst, 79 years, ground-rent 25*l.*	1,180

By NAYLOR & MUNCEY.

Dalston—27, Pownall-road, 56 years, ground-rent 4*l.* 5s.	250

By DRIVER & CO.

Pimlico—An improved rental of 301*l.*, term 34 years	3,000

By HOBSON, RICHARDS, & CO.

Dalston—88, 90, and 92, Broke-road, 56 years, ground-rent 12*l.*	905
94, 96, and 92, Broke-road, 56 years, ground-rent 12*l.*	885

By J. T. BEDFORD & CO.

Camberwell—34 and 36, Havil-street, freehold	910

JUNE 16.

By BEADEL & CO.

Chelmsford, near—The residence called Springfield Dukes, and 3a. 0r. 3p., freehold	2,000
A plot of land, 1a. 3r. 4p., freehold	400
Eight plots of freehold land, containing 8 acres	1,170
A plot of land, 1a. 2r. 13p., freehold	200

By T. G. WHARTON.

Barnes—5 to 8, Stanley-villas, 88 years, ground-rent 14*l.* 15s.	1,000
Richmond—5 and 6, Maxwell-villas, freehold	695

By C. C. & T. MOORE.

Mile End—73, Lichfield-road, 55 years, ground-rent 3*l.* 10s.	300
13, Emmott-street, 83 years, ground-rent 4*l.* 4s.	240
142 and 144, Burdett-road, 76 years, ground-rent 18*l.*	500
Poplar—21, Lion-street, 55 years, ground-rent 3*l.*	200
Forest Gate—98a, 99, and 100, Forest-lane, 477 years, ground-rent 30*l.*	500
Manor Park, Capel-road—Four houses, 95 years, ground-rent 20*l.*	505

By E. STIMSON.

Fulham, High-street—Three freehold plots of land	2,050
2, 4, 6, and 14, Walham Avenue, 92 years, ground-rent 24*l.*	435
Brixton-road—An improved rental of 34*l.*, term 12 years	280
10, Tintern-street, 89 years, ground-rent 6*l.* 10s.	290
Kennington—44, 45, and 46, Walcot-square, 20 years, ground-rent 18*l.* 18s.	780

By NEWSON & HARDING.

Finsbury Park—94, Isledon-road, 64 years, ground-rent 8*l.*	400
19, Osborne-road, 86 years, ground-rent 6*l.* 6s.	400
Brixton—243, Milkwood-road, 79 years, ground-rent 5*l.*	255
Barnsbury—34 and 36, Copenhagen-street, 32 years, ground-rent 10*l.*	540
Canonbury—3, Canonbury-terrace, 31 years, ground-rent 6*l.* 6s.	310
Chiswick—131 and 133, Devonshire-road, and 1 to 5, James-street, freehold	370
Stoke Newington—11 and 12, Goldsmith-square, 64 years, ground-rent 8*l.*	355
Green Lanes—9, Queen's-road, 72 years, ground-rent 9*l.*	335

By DEBENHAM, TEWSON, & CO.

City—14, 15, and 16, St. Swithin's lane, area 2,036 ft.	Let at 1,120*l.* a year
Maldon—The Clock House Farm, and 88a. 2r. 6p., freehold	870
Farnham Royal, Bucks—The Lodge, and 23a. 2r. 7p., freehold and copyhold	5,000
West Drayton, near — The freehold residence, Doghurst, and 16a. 1r. 22p.	5,000

By ROUCH & PARKHOUSE.

Cornwall—The Goodevere Tin Mine, with all rights, plant, and machinery	100

JUNE 17.

By DRIVER & CO.

Westminster—17, Page-street, 22 years, ground-rent 6*l.*	300
Finchley—1 and 2, Davis's cottages, copyhold	700

By ELLIS & SON.

Soho—4, Church-street, freehold	1,160

By H. STAINES.

Kennington—7, 9, and 11, Cleaver-street, 23 years, ground-rent 12*l.*	275
Dalston—18, 19, and 20, Temple-street, 32 years, ground-rent 6*l.* 10s.	655
Hackney-road—73 to 91 odd, Boston-street, 8½ years, ground-rent 14*l.*	420

By WHITE & SONS.

Charlwood, Surrey—Freehold brickyard and woodland, 26a. 0r. 17p.	400
Newdigate—An enclosure of garden ground	10

Ockley — Two freehold enclosures of land, 23a. 2r. 34p. £1,000

By BAKER & SONS.

Pinner—Sweetman's Hall, and 4a. 0r. 37p., freehold 1,800
Six plots of freehold land, 4a. 2r. 7p. 1,245
Tilbury, Essex—Two plots of freehold land..... 1,010

By C. & H WHITE.

Westminster Bridge-road—No. 78, freehold 720
Hammersmith—36 and 38, Southerton-road, 78 years, ground-rent 12*l.* 450
15, Burfield-street, 82 years, ground-rent 7*l.* 225
34, 36, and 48, Cambridge-road, 57 years, ground-rent 12*l.* 780
25, Redmore-road, 81 years, ground-rent 4*l.* 10s... 200
69, Naysmith-street, 82 years, ground-rent 5*l.*..... 160

By TAYLOR, LOVEGROVE, & Co.

Kensington, Kelso-place—A plot of freehold land... 750

By C. D. FIELD & SONS.

Bermondsey—121, Weston-street, 27 years, ground-rent 3*l.* 200
141, Weston-street, 27 years, ground-rent 5*l.* 300
1 to 18, and 32, Weston-place, 27 years, ground-rent 19*l.* 3,095
Blackfriars—138, Broadwall, freehold 330
4 and 6, Brunswick-street, freehold 1,010
14 to 19, Hatfield-place, 8½ years, ground-rent 12*l.* 270
60, Great Suffolk-street, freehold 345
22 and 24, Red Cross-street, freehold..... 270
Stepney—53, 65, and 67, Charles-street, 13¾ years, ground-rent 24*l.* 200

MEETINGS.

SATURDAY, JUNE 25.

St. Paul's Ecclesiological Society.—Visit to Bishop's Stortford, &c. Train leaves Liverpool-street at 2·32 p.m.

Glasgow Architectural Association.—Visit to Dunfermline.

WEDNESDAY, JUNE 29.

Society of Arts.—Annual General Meeting. 4 p.m.

Miscellanea.

The New Scandinavian Sailors' Home in London.—We understand that the building committee of the Scandinavian Sailors' Home in London some time ago succeeded in securing a site for the new building of the Home in the very heart of the locality where it operates. The patrons of the Home are H.R.H. the Princess of Wales, and their Majesties the Queens of Denmark and Sweden and Norway, whilst the building committee consists of Lord Blantyre, Mr. T. A. Denny, and Mr. David Carnegie. During the last seven years the Home has been located at Nos. 88 and 90, Leman-street, but for a long time these buildings have far from sufficed for the requirements, besides being ill adapted to the functions of such an Institution. The lease of these houses expiring in September next, the committee decided upon not renewing the same, but to attempt finding an eligible site for a new building in the same neighbourhood, a task not of the easiest in this crowded locality. They succeeded, however, beyond expectation, having acquired a piece of land from the East and West India Dock Company, close to the East and West India Dock Stations, at a cost of 1,700*l.*, the superficial area being nearly 30,000 square feet. The building will face Garford-street, but the frontage here will only be about 50 ft. in length, due to the peculiar shape of the site. This is, however, considered an advantage by the commitee, as only a portion of the rooms will overlook the noisy street with its dust, &c., whilst the majority will face a handsome garden to be laid out at the back of the building. The new Home will contain bedrooms for about 200 sailors, besides some superior apartments for captains and mates, and rooms for entertainments and mission work, a library, restaurant, baths, bowling-alley, in addition to the usual offices, &c. The new Home, which, like the old, will be under the management of Miss Agnes Medenström, a Swedish lady celebrated throughout Scandinavia for her excellent mission work among the thousands of northern sailors who annually visit London, will be conducted on strictly Temperance principles. It is stated that the Princess of Wales has collected a considerable sum of money towards the cost of the new building, of which we hope to give an illustration on a future occasion.

Photographs of Lightning.—The Royal Meteorological Society is desirous of obtaining photographs of flashes of lightning, as it is believed that a great deal of research on this subject can only be pursued by means of the camera.

A Carved Oak Pulpit, with freestone base, has been erected in the Parish Church at Burlescombe (Devon), as a Jubilee Memorial. The work has been executed by Messrs. Luscombe & Son, carvers and art-workers, of Exeter.

The New Winchester House Buildings.—Some interesting statements were made at the meeting of the Winchester House Company last week respecting the prospects of the extensive and costly new buildings in Broad-street in the City, which are scarcely yet completed, although several portions of them are already let and occupied. Mr. John Pender, the chairman, said that the cost of the freehold alone had amounted to no less than 405,000*l.*, but he considered that the Company had secured a most valuable property and that their new building was the finest in the City of London. The original estimate of the cost of the new building had been exceeded, owing to the necessity of acquiring other property besides old Winchester House itself, and also in consequence of their having been advised to sink down to the London clay, the additional cost in carrying out this portion of the work having been 3,000*l.*, and the total cost of the double basement alone was fully 20,000*l.* He added that the lettings already amounted to 21,658*l.* a year, and that the amount receivable from Messrs. Spiers & Pond for the letting of a portion of the halls was likely largely to increase during the present year. It appeared to him that these halls of theirs, which were now constantly occupied, were likely to become popular places for public meetings in the city. They had now completed the safe deposit system, which would utilise one portion of the building, and, as there would be 5,000 safes, it was calculated that that branch of their business would bring in from 11,000*l.* to 12,000*l.* a year, and the unlet portions of the building were estimated to produce about 15,000*l.* a year. Their expenses were estimated at 26,000*l.* a year, of which 21,000*l.* were for ground-rents and interest on mortgages.

Sale of Building Land at Pinner.—Amongst the numerous sales of building land which have recently taken place, both in the neighbourhood of the metropolis and more distant localities, fifty plots of this class of property were submitted to competition on Thursday week by Messrs. Baker & Sons. The property offered consisted of the first portion of the Pinner Chase Estate, adjoining the Pinner Station of the Metropolitan Railway, and also within a few minutes' walk of the London and North-Western station. The several lots have frontages to the station road, the Pinner main road, and to Took's memorial fountain. The sale took place in a marquee on the estate, and all the lots were announced to be sold without the slightest reserve. Most of the lots offered consisted of shop plots, having frontages of 18 ft. and 20 ft., and depths varying from 70 ft. to 90 ft. All the lots were readily sold at prices ranging from 15*l.* to 25*l.* each.; a corner tavern site, having a frontage to the main road of 54 ft., and a return frontage to the station road of 80 ft., being sold for 65*l.*, the stipulations providing that the cost of the building to be erected on this site must not be less than 500*l.*, and on the other sites not less than 200*l.* and 300*l.* The estate has been laid out for the erection of 136 houses and shops.

Testing Establishment for Ventilating and Heating Appliances.—The Technical High School at Berlin is now receiving an addition in the form of an establishment for testing the caloric properties of various kinds of fuel, and thus facilitating estimates of the cost of heating state buildings. Similar experiments will be carried on as to ventilation. The necessary funds for the installation of this establishment are included in the Budget of 1887-8, and provision has also been made for the expenses of maintaining its efficiency. It will be specially advantageous, the *Centralblatt der Bauverwaltung* considers, for senior pupils of the High School and for young architects.

Building in Berlin.—Official statistics indicate a marked increase of activity during 1886 in the building trade at Berlin, the works executed having exceeded by 1,000 the number carried out in 1885. Accidents were reported in greater number, but this is attributed to the more complete system of registration now in force. Out of 438 casualties, 16 were fatal, 165 severe, and 257 slight in their effects. In most cases, the *Diamant* remarks, no blame was attributable to any third party, the accidents being due to the inattention or carelessness of the persons injured. The new regulations for building contain a provision for only two-thirds of any site being built over, one-third at least being reserved as a yard or open space.

Threatened Destruction of the Blue Grotto at Capri.—According to an Italian journal, the *Vita Napolitana*, the famous Grotto Azurra, or Blue Grotto, at Capri, will shortly be the subject of a lawsuit before the Naples Tribunals, which may result in its destruction. The facts are as follow:—For some years past that part of the island below which the world-famed grotto is situated has been owned by a rich American "gentleman," who now claims "that, as he is the owner of the soil, what is beneath it also belongs to him, viz., the Blue Grotto." But as this from time immemorial has belonged to the little fishing village of Capri, and as the civic authorities charge each visitor to the grotto a small sum, they do not intend to part with their property without a contest. In consequence, the American gentleman has begun a lawsuit against the Capri authorities before the Naples Tribunals in order to obtain the proprietorship of the grotto, and, what is worse, threatens, in the event of his losing the case, to pierce a hole in the ground into the grotto, which would, as is generally known, have the effect of at once destroying the lovely tints of colour for which the grotto is so justly famous. There is, however, some hope of satisfying the American's claim with part of the revenue derived from visitors to the grotto.

The Sound Tunnel.—It appears that the negotiations between a French syndicate and the Scandinavian Government for the construction of a tunnel under the Sound, to which we recently referred, were broken off in consequence of the committee appointed to consider the scheme reporting against it. The feasibility of constructing the tunnel was in no way denied, the undertaking being in fact pronounced comparatively simple, but the committee objected chiefly to certain financial proposals of the promoters. Now, however, negotiations have been resumed between the latter and the Danish Government, the promoters having modified their conditions, and it is expected that the Swedish Government will also shortly re-consider the scheme. It should, however, be mentioned that public opinion in Sweden is not in favour of the tunnel, though its advantages are fully recognised.

The Baltic and White Sea Canal.—The Society for Promoting Russian Trade and Industry, says the *Novoje Vremja*, has submitted a plan to the Government for the construction of a canal from the Baltic to the White Sea, *vid* Lake Ladoga, an undertaking said to have been suggested by Peter the Great. Such a canal, apart from its strategical value, would open up the famous iron deposits in the Government of Olonetz, as well as develop trade in Northern Russia. The cost of the canal is only estimated at about 800,000*l.*, but it is generally believed that this sum is too low. The Emperor of Russia is stated to be much interested in the plan.

Strikes in the United States.—During the first five months of this year, 480 strikes were reported in the United States, involving 226,803 wage workers, against 164 strikes during the corresponding period of last year, involving 364,630. During May of the present year, 79,000 men struck, against 216,000 in May, 1886. The building trades show 44,573 men on strike; coal-miners and coke-makers, 18,650; boot and shoe makers, 5,650. The unsettled condition of the American labour-market is not extending at present; but it is stated that about 60,000 workmen will make fresh demands in various branches of trade for higher wages shortly.

Jubilee Clocks in Kent.—As a permanent memorial of the Queen's jubilee, the parishioners of Willesborough have placed in the parish church tower a clock specially constructed by J. W. Benson, of Ludgate-hill. Time is shown on two copper dials of 5 ft. diameter, the hours are struck on a bell of 15 cwt., and "ting tang" quarter chimes on two smaller bells. At Horsmonden a suitable turret has been erected on the Working Men's Institute, in which a clock has been fixed by the same maker. There are two copper dials of 3 ft. diameter, and the hours are struck on a bell of 1 cwt.

Trade Outing.—On Saturday last the office staff of Messrs. Wm. Brass & Son, of Old-street, E.C., had a most enjoyable trip to the Royal Forest Hotel, Chingford, where a cricket match was played, married *v.* single, which ended in a victory for the latter with 18 runs, after which they sat down to a "high tea," and concluded a most enjoyable outing with a stroll in the Forest.

Improved Method of Preparing Cement. The *Thonindustrie Zeitung* lately published the following details as to a recently-patented system for hastening the setting and increasing the resistance of Portland cement. There are taken 100 parts of finely-pulverised bauxite, or in its place 100 parts of any refracting argillaceous earth in powder. These are mixed with 50 parts of sulphuric acid, so as to make a firm paste. After twenty-four hours, the mass is heated in a flaming furnace until it hardens and assumes a light colour. It is then finely pulverised, and baked with water in such a way as to form a liquid paste. There is then added a solution of soda so as to render the liquid alkaline, and afterwards, by decantation, the water is separated from the precipitate, which is carefully dried, pulverised, and sifted. The hydrate of albumen, which is found in the closest portions, causes the rapid setting of the cement, while the soluble silicum increases its resistance. If it be desired to change a slow-setting into a quick-setting cement, it is sufficient to mix thoroughly about half to one per cent. of the powder. For making moulded objects, the proportion should be two to four per cent.

PRICES CURRENT OF MATERIALS.

TIMBER.	£. s. d.	£. s. d.
Greenheart, B.G. ....ton	5 10 0	7 10 0
Teak, E.I. ....load	8 0 0	12 0 0
Sequoia, U.S. ....foot cube	0 2 3	0 3 0
Ash, Canada ....load	3 0 0	4 10 0
Birch ,, ...	2 0 0	3 10 0
Elm ,, ...	3 10 0	4 10 0
Fir, Dantsic, &c.	1 10 0	4 0 0
Oak ,, ...	2 10 0	4 10 0
Canada	3 0 0	6 0 0
Pine, Canada red	2 0 0	3 10 0
,, yellow	2 10 0	4 10 0
Lath, Dantsic ....fathom	3 0 0	5 0 0
St. Petersburg	4 0 0	5 10 0
Wainscot, Riga ....log	0 0 0	0 0 0
,, Odessa, crown....	2 15 0	3 0 0
Deals, Finland, 2nd and 1st...std.100	7 0 0	8 0 0
,, 4th and 3rd	5 10 0	6 10 0
Riga	5 10 0	7 0 0
St. Petersburg, 1st yellow	8 0 0	13 0 0
,, 2nd ,, ...	7 0 0	8 0 0
,, white	6 10 0	8 10 0
Swedish	0 0 0	0 0 0
White Sea	7 0 0	16 0 0
Canada, Pine, 1st	16 0 0	24 0 0
,, ,, 2nd....	10 0 0	15 0 0
,, ,, 3rd, &c....	6 0 0	9 0 0
,, Spruce, 1st	8 0 0	9 0 0
,, ,, 3rd and 2nd	5 0 0	7 0 0
Deals—New Brunswick, &c.	5 0 0	6 10 0
Battens, all kinds	4 0 0	10 10 0
Flooring Boards, sq., 1 in., prepared, First	0 8 0	0 11 0
Second	0 6 6	0 7 6
Other qualities	0 5 0	0 6 0
Cedar, Cuba ....foot	0 0 3½	0 0 3½
Honduras, &c.	0 0 3	0 0 3½
Australian	0 0 2	0 0 3
Mahogany, Cuba	0 0 4	0 0 7
St. Domingo, cargo average	0 0 4	0 0 6
Mahogany, Mexican, cargo av....	0 0 3½	0 0 4
Tobasco ,, ...	0 0 4	0 0 5½
Honduras ,, ...	0 0 3½	0 0 5½
Maple, Bird's-eye	0 0 6	0 0 8
Rose, Rio ....ton	8 0 0	11 0 0
Bahia....	8 0 0	9 0 0
Box, Turkey ....ton	5 0 0	13 0 0
Satin, St. Domingo ....foot	0 0 5	0 0 9
Porto Rico	0 0 6	0 0 10
Walnut, Italian	0 0 3½	0 0 5½
METALS.		
IRON—Bar, Welsh, in London...ton	4 7 6	4 15 0
,, ,, in Wales	4 2 6	4 7 6
,, Staffordshire, London	5 10 0	6 0 0
Sheets, single, in London	6 15 0	8 10 0
Hoops ,, ...	6 0 0	7 0 0
Nail-rods ,, ...	5 15 0	6 10 0
COPPER—		
British, cake and ingot ....ton	42 10 0	43 0 0
Best selected	44 0 0	44 10 0
Sheets, strong....	50 0 0	0 0 0
Chili, bars	39 16 3	40 2 6
YELLOW METAL ....lb.	0 0 0	0 0 0
LEAD—		
Pig, Spanish ....ton	12 7 6	0 0 0
English, common brands....	12 12 6	0 0 0
Sheet, English	13 12 6	13 17 6
SPELTER—		
Silesian, special ....ton	14 12 6	14 15 0
Ordinary brands....	14 10 0	14 12 6
TIN—		
Straits....ton	102 17 6	103 7 6
Australian	103 2 6	103 12 6
English ingots	106 0 0	0 0 0
ZINC—		
English sheet ....ton	0 0 0	0 0 0
OILS.		
Linseed ....ton	22 5 0	22 10 0
Cocoanut, Cochin	30 0 0	33 0 0
Ceylon	24 0 0	24 5 0
Palm, Lagos	21 10 0	0 0 0
Rapeseed, English pale	24 0 0	24 5 0
,, brown	22 10 0	23 15 0
Cottonseed, refined	21 7 6	22 0 0
Tallow and Oleine....	25 0 0	45 0 0
Lubricating, U.S.	5 0 0	6 0 0
,, refined....	5 0 0	13 0 0
TURPENTINE—		
American, in casks ....cwt.	1 7 9	1 8 0
TAR—		
Stockholm ....barrel	0 14 0	0 14 6
Archangel	0 11 6	0 12 0

CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Pumping Engines, Iron Pipes, &c.	Edmonton Local Board	G. E. Eachus....	June 27th	ii.
Stone Kerbing	Norwood Highway Bd.	A. J. Hanson....	do.	ii.
Repairs and Alterations	Lewisham Bd. of Works	*Official*	June 28th	ii.
Jobbing Work	Tottenham Local Board	do.	do.	ii.
Re-Erection of Footbridge....	Chelsea Vestry....	do.	do.	ii.
Paving Work	St. George-in-the-East Vestry	do.	June 30th	ix.
Road Materials	Folkestone Corporation	A. W. Conquest	do.	ix.
Storekeeper's Dwelling, &c., Harwich	Trinity House Cor.	*Official*....	do.	ii.
Repairing, Painting, &c., Street Lamps....	Fulham Vestry....	do.	July 1st	ii.
Wooden Drill Shed, Island of Lewis	Admiralty	do.	do.	ii.
Broken Guernsey Granite and Curb	Bermondsey Vestry....	do.	July 4th	ix.
Caretaker's Cottage	Hornsey Local Board...	T. De Courcy Meade ...	do.	i.
Wrought-Iron Hurdles and Gates	Southend Local Board...	F. H. Tulloch....	July 5th	ix.
Erection of School....	Swansea School Board ..	*Official*	do.	i.
Making-up and Paving Roads	Wandsworth Bd. of Wks	do.	do.	ix.
Erection of Buildings	Eastern Counties' Asylm for Idiots	R. F. Vallance	July 6th	ii.
Sewerage Works	Kingston R. S. A....	B. Latham	do.	ii.
Rebuilding Spire of Church, Kettering	The Committee....	A. W. Blomfield	do.	ix.
New Head Post-Office, Eastern District	Com. of H.M. Works...	*Official*	July 8th	i.
Water Supply Works	Brixham Local Board...	E. Ellis	do.	ix.
Brick Sewer, Granite Carriageway, &c....	Met. Board of Works...	*Official*	do.	ix.
Fire Brigade Station, Camden Town	do.	do.	July 11th	ix.
Road Making and Paving Works	Fulham Vestry....	do.	July 13th	ix.
Farm Labourers' Cottages, Gosport	War Department....	do.	Not stated...	i.
Alterations, &c., Kentish Town-road	....	E. W. Poley	do.	ix.
Supply of, Laying and Repairing, Tar Paving	Schl. Board for London	*Official*	do.	ix.
Portable Iron School Rooms	do.	do.	do.	ix.
Gas Mains and Fittings	do.	do.	do.	ix.
Builders' Ironmongery....	do.	do.	do.	ix.
New Schools, and other Works....	do.	do.	do.	ix.
Painting, &c., Repairs....	do.	do.	do.	ix.
New Sunday School Buildings, Northampton	The Committee....	J. W. Chapman....	do.	ix.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Inspector and Surveyor's Assistant....	Chelsea Vestry....	120*l.*, &c....	June 30th	xvi.
Clerk of the Works	West Bromwich Cor....	3*l.* 3*s.* weekly	July 2nd	xvi.
Clerk of the Works	Eastern Counties Asylm for Idiots....	Not stated	July 6th	xvi.
Clerk of the Works	Cambridge Imp. Com.	2*l.* 5*s.* weekly	Not stated ...	xvi.
Borough Surveyor	Canterbury Cor.	250*l.*, &c....	do.	xvi.

TENDERS

ABINGDON (Berks).—For new drainage system, sanitary improvements, and plumbers' work to North-court House, Abingdon. Mr. H. Hardwicke Langston, architect, 9, Great James-street, Bedford-row, London :—

John Smeaton (accepted).....	£220 0 0

BIGGLESWADE.—For the erection of business premises for Mr. R. T. Swift. Messrs. Usher & Anthony, architects and surveyors, Bedford :—

Dalby Bros., Biggleswade	£876 0 0
Redhouse, Stotford....	830 0 0
Twelvetrees, Biggleswade....	787 0 0
White, Bedford	785 0 0
Harrison, Bedford	780 0 0
Page, Buckden....	763 0 0
Bushby, Biggleswade....	737 0 0
Bartle & Rainsford, Potton	708 5 0
Woodman, Potton (accepted)	659 0 0

BLACKHEATH.—For building additions storey to Point House, Blackheath, for the West Kent and Greenwich Carlton Club Co. Mr. Albert L. Guy, architect, 78, High-street, Lewisham :—

Knight	£343 0 0
Kennard Bros.	334 0 0
S. J. Jerrard....	323 0 0
H. L. Holloway (accepted)	285 0 0
Waddington	268 15 0

BOXFORD (near Newbury).—For partly rebuilding The Bell Inn, Boxford, near Newbury, for Messrs. T. B. Hawkins & Co. Mr. James H. Money, architect, The Broadway, Newbury :—

Samuel Elliott, Albert Works, Newbury....	£667 0 0
Henry Botsford, Newbury	647 0 0
George Elms, Benham, Newbury* ...	609 10 0

* Accepted.

HINCKLEY.—For construction of new roads, footpaths, &c., laying new drains, forming manholes, &c., near the Lawns, Hinckley, for the Hinckley Permanent Benefit Building Society. Mr. Josias Wells, surveyor :—

John Smith, Belgrave	£1,110 10 0
Heatherley & Co., Follshill	1,093 0 0
J. Speight, Leeds....	1,090 0 0
Bott & Ward, Leicester....	1,075 13 10
S. & E. Bentley, Leicester*	996 0 0
Rawlins & Boswell, Knighton	901 3 11

* Accepted.

LEWISHAM.—For building villa residence, High-street, Lewisham, for Mr. Walter Smith. Mr. Albert L. Guy, architect, 78, High-street, Lewisham :—

Staines & Son	£894 0 0
H. L. Holloway]	819 0 0
Balsam Bros....	810 0 0
Knight....	790 0 0
Kennard Bros. (accepted)	785 0 0

LONDON.—For erecting warehouse, Botolph-lane. Mr. A. R. Stenning, architect :—

Brass	£1,342 0 0
Wall....	1,307 0 0
Colls....	1,270 0 0
Macey	1,185 0 0
Down	1,240 0 0
Chafen	1,180 0 0
Nightingale	1,163 0 0
Woodward	1,080 0 0
Sabey & Son	1,043 0 0

LONDON.—For erecting warehouse, 24, Duke-street. Mr. T. A. Smith, architect :—

Woodward....	£1,050 0 0
Jarvis	905 0 0
Lawrence	902 0 0
Morter....	898 0 0
Downs....	890 0 0
Jackson & Todd	869 0 0
Brass	863 0 0
Cox	843 0 0
Turner....	850 0 0
Nightingale	825 0 0
Sabey & Son	768 0 0

LONDON.—For works at 25 and 26, Duke-street. Mr. T. A. Smith, architect :—

Woodward....	£2,620 0 0
Downs	2,560 0 0
Morter....	2,536 0 0
Jarvis	2,530 0 0
Scrivener....	2,520 0 0
Sabey & Son	2,498 0 0
Lawrence	2,496 0 0
Jackson & Todd	2,393 0 0
Brass	2,393 0 0
Cox	2,357 0 0
Nightingale	2,330 0 0

LONDON.—For new iron drains, white-glazed brick manholes, plumbers' work, additions to scullery, and other alterations and improvements at 29, Park-lane, W., for the Right Hon. Lord Robartes. Mr. Charles Edward Coritton, surveyor, Sidcup, Kent :—

J. Haywood, 40, South-street, W.* ...	£275 0 0

* Accepted.
(Lower of two tenders received.)

LONDON.—For new drains, sanitary improvements, and plumbers' work to 6, Albert-street, Lower Grosvenor-place, S.W. Mr. H. Hardwicke Langston, architect, 9, Great James-street, Bedford-row, London :—

John Smeaton (accepted).....	£120 0 0

MARSTON (Beds).—For rebuilding the Exhibition public-house at Marston, for Mr. C. Wells. Messrs. Usher & Anthony, architects and surveyors, Bedford :—

Freshwater	£315 0 0
Warton & Walker	313 0 0
Warwick & Osborn....	300 0 0
Foster (accepted)	297 0 0

[All of Bedford.]

NEWPORT PAGNELL.—For the erection of dwelling-house at Newport Pagnell, Bucks., for Mr. G. O. Price. Messrs. Usher & Anthony, architects and surveyors, Bedford:—

Coverley, Newport Pagnell	£1,724	0	0
Henson, Wellingborough	1,700	0	0
Wilford Bros., Newport Pagnell	1,625	0	0
Harrison, Bedford	1,603	0	0
White, Bedford	1,587	0	0
Mitchell, Newport Pagnell	1,554	0	0
Foster, Kempston	1,525	0	0
Gaskins, Great Lindford	1,519	0	0
Shelton, Newport Pagnell	1,087	0	0

PORTSMOUTH.—For rebuilding on the site of the old Capital and Counties Bank, Commercial-road, Portsmouth, for Mr. A. Stedall. Mr. George Edwards, architect, 11, Queen Victoria-street. Quantities by Mr. H. Lovegrove:—

D. W. Lewis, Southsea	£4,339	0	0
Martin Wells & Co., Aldershot	4,300	0	0
W. Ward, Fratton	4,186	0	0
Perry & Co., London	4,150	0	0
J. H. Corke, Southsea	4,075	0	0
H. Jones, Southsea	4,058	0	0
T. P. Hall, Southsea	4,025	0	0
J. Collings, Landport	3,975	0	0
J. Bull & Sons, Southampton	3,947	0	0
Stephens & Bastow, London	3,877	0	0
W. P. & C. Light, Portsmouth*	3,758	0	0

* Accepted.

SANDY (Beds).—For the erection of two villas, Bedford-road, for Mr. Jos. Triplow. Messrs. Usher & Anthony, architects and surveyors, Bedford:—

Twelvetrees, Biggleswade	£1,434	0	0
Bartle & Rainsford, Potton	1,336	0	0
White, Bedford	1,289	0	0
Page, Buckden	1,270	0	0
Foster, Kempston	1,245	0	0
Harrison, Bedford (accepted)	1,235	0	0

STRATFORD.—For the rebuilding of the Blue Boar Public-house, High-street, Stratford, E., and for the erection of a house and shop adjoining, and also three cottages in Station-street, for Messrs. Charrington & Co. Mr. John Hudson, architect, 80, Leman-street:—

T. Little, Whitechapel	£5,014	0	0
A. Reed, Stratford	4,973	0	0
Norton & Son, Stratford	4,909	0	0
J. & H. Cocks, Mile End	4,705	0	0
Eaton & Co., Whitechapel	4,538	0	0
F. & F. J. Wood, Mile End	4,439	0	0
W. Gladding, Mile End	4,429	0	0
J. Bentley, Waltham Abbey	4,386	0	0

WANDSWORTH.—For steam-pipes, channels, &c., at the new Workhouse, Garratt-lane, for the Guardians of the Wandsworth and Clapham Union. Mr. Thomas W. Aldwinckle, 2, East India Avenue, Leadenhall-street, architect:—

F. Bird & Co.	£695	0	0
T. Bradford & Co.	642	0	0
W. Hammond (accepted)	585	10	0
R. Crane	575	0	0
J. & F. May	556	0	0

WIMBLEDON.—For erecting house at Wimbledon. Mr. Gray, architect, Northampton:—

Jones	£5,185	0	0
Mudie	4,884	0	0
Hernor	4,324	0	0
Cropley	4,222	0	0
Ackerman	4,055	0	0
Chappell	3,700	0	0
Sabey & Son	3,667	0	0
Clark	3,226	0	0

Alterations, 52, Strand.—We are asked by Mr. F. A. Dovey, of 231, Burrage-road, Plumstead, to say that he, and not Mr. Banister Fletcher, is the architect for this work, the list of tenders for which was published in our last. We printed the list as we received it.

*** SPECIAL NOTICE.—Lists of Tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, W.C., not later than 12 Noon on THURSDAYS.

PUBLISHER'S NOTICES.

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DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same, must reach the Office before TEN o'clock on WEDNESDAY mornings.

The Publisher cannot be responsible for DRAWINGS TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder," may have *Replies addressed to the Office, 46, Catherine-street, Covent Garden, W.C. free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN CIRCULATION, is issued every week.

MAP OF LONDON, showing Boundaries of Surveyors' Districts. The four Sheets, into which the Map is divided (issued with the numbers of January 1st, 8th, 15th, and 22nd), if sent to the Office direct, or through any Newsagent, can be MOUNTED on the following Terms, viz.:—

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*** Omissions discovered since publication will be corrected before mounting.

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"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, and New Zealand, 26s. per annum. To India, China, Ceylon, &c. 30s. per annum. Remittances payable to DOUGLAS FOURDRINIER, Publisher, No. 46, Catherine-street, W.C.

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TO CORRESPONDENTS.

Registered Telegraphic Address, "THE BUILDER, LONDON."

A Quarryowner (we cannot re-open the subject now; nor, to say truth, can we regard the record of the practice of Solomon as quite conclusive in the matter).—H. S. T.—"Rusticus" (letters cannot be published unless the name and address of writer are enclosed).—R. F. (thanks).—T. M. H. (too late).

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

Best Bath Stone.

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Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, granaries, tun-rooms, and terraces. [ADVT

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LIVERPOOL: 6 and 8, HATTON GARDEN.
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The BUILDER

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"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON.

"Our English word TO BUILD is the Anglo-Saxon Býlðan, to confirm, to establish, to make firm and sure and fast, to consolidate, to strengthen; and is applicable to all other things as well as to dwelling-places."—DIVERSIONS OF PURLEY.

"Always be ready to speak your mind, and a base man will avoid you."—WILLIAM BLAKE.

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